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1 program.

2 On top of that I have a U.S. Coast  
3 Guard master's license for one hundred tons. I  
4 have been trained as a marine surveyor and  
5 worked in that capacity for a while. That is  
6 about it for training.

7 Q. Are you presently employed?

8 A. Yes, I am.

9 Q. By whom?

10 A. By myself and my company is Marine  
11 Chemist & Testing Company.

12 Q. How long have you had that company?

13 A. Just under twenty years.

14 Q. And what does Marine Chemist &  
15 Testing Company do?

16 A. Basically Marine Chemist & Testing  
17 Company does marine chemist inspections on board  
18 ships, vessels and shoreside tanks that may have  
19 contained flammable or combustible materials or  
20 toxic materials to the extent that we are  
21 required by law to inspect them and then certify  
22 that those areas are safe either for entry or  
23 for hot work.

24 Q. Do you sometimes have the occasion  
25 to work on vessels at Bradford Marine?

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1 A. Yes, I do.

2 Q. Do they call you on a regular  
3 basis?

4 A. Yes, they do. I was there this  
5 morning, as a matter of fact, on this.

6 MR. VALLE: Another accident, was  
7 it?

8 THE WITNESS: No, we prevent them.  
9 I don't have accidents.

10 BY MR. FAMULARI:

11 Q. Did there come a time when they  
12 asked you to come down and look at a yacht  
13 called the SOUVENIR?

14 A. Yes, they did.

15 Q. Do you recall when that was?

16 A. I don't recall the date. I know I  
17 wrote a letter that you have a copy of there  
18 that probably states those dates, but I don't  
19 recall off the top of my head.

20 Q. If I was to say it was in 1997  
21 would that sound --

22 A. That is correct.

23 Q. -- Correct to you?

24 A. Yes, that is correct.

25 Q. Who usually calls you down to work

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1 on vessels?

2 A. Oh, it is different people now than  
3 it was then.

4 Back then it would have been Mark  
5 Tortora, a fellow named Torch, or Dave Henderson  
6 and, of course, now they have other people who  
7 call me in similar capacities that they had back  
8 then.

9 Q. Do you remember what you were  
10 called to do when, back in 1997 when they asked  
11 you to look at the SOUVENIR?

12 A. Yes, they said that there had been  
13 an explosion on board and they asked me to come  
14 down and see if I could help them determine what  
15 may have caused the explosion.

16 Q. Did you, prior to the explosion had  
17 you been down on the SOUVENIR to gas free any  
18 areas?

19 A. Several months before that I had  
20 been on board and written a chemist certificate  
21 for fuel tanks, I believe, and maybe an engine  
22 room.

23 But that was areas completely  
24 removed from this and that work as I understand  
25 it had already been completed long before this

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1 accident.

2 Q. Can you explain to us what a gas  
3 free certificate is?

4 A. Yes, after I have performed an  
5 inspection to determine whether an area is safe  
6 for entry so that the space is safe for  
7 breathable air and nothing toxic in it and/or  
8 have inspected the space so that I have  
9 determined that it is safe to do hot work, in  
10 other words, there is no flammable or  
11 combustible liquid in the space, no sludge left  
12 in the space that might be flammable and that  
13 there is no way to have things come back into  
14 the space that could become flammable or  
15 explosive, then I write a certificate which is  
16 called a marine chemist certificate. They are  
17 numbered. There are usually five copies and I  
18 keep one and the rest are left with the yard.

19 One is posted on the vessel that  
20 stipulates what I have inspected, where I have  
21 inspected, what my instructions as far as is it  
22 safe or not safe and if there are any  
23 limitations, those are put out certificate and  
24 then there is, of course, standard boilerplate  
25 that is on there that talks about the

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1 requirements that would void the certificate and  
2 so on.  
3 Q. Okay, and what kind of things would  
4 void the certificate?  
5 A. Movement of the vessel, changing of  
6 conditions. In other words, if a shipyard  
7 competent person came down and saw that the  
8 space that I had certified had fuel back in it  
9 or if he threw his meter in it and it got a  
10 combustible reading that was different than what  
11 I had specified on the certificate which is  
12 normally zero, in other words, if he got a  
13 reading, then at that point he is required to  
14 stop work and call me to come back and  
15 reinspect, determine what the problem is and  
16 proceed from there.  
17 Rarely does it happen. Usually  
18 once we get things under control they stay under  
19 control. I can recall very few situations other  
20 than where someone intentionally went back into  
21 a space and recontaminated it by doing  
22 something.  
23 Rarely does it happen accidentally  
24 that things recontaminate a space, but that is  
25 why the competent person is there everyday, is

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1 to check and make sure that those unexpected  
2 things don't happen.  
3 Q. And could you explain to us what a  
4 shipyard competent person is?  
5 A. Right. OSHA 2268 which is, what is  
6 it, 29 CFR 1915, specifies that a person be  
7 trained as a shipyard competent person.  
8 And a person who is trained to know  
9 certain parts of that standard understand how to  
10 read a marine chemist certificate and carry out  
11 the directions of the marine chemist, knows how  
12 to use an oxygen meter, combustible gas  
13 indicator, carbon monoxide and carbon dioxide  
14 meter, understands basically the regulations and  
15 there are some other things besides those, but  
16 those are the basic ones.  
17 MR. VALLE: What is the  
18 subsection?  
19 MR. KALLEN: 1915.  
20 MR. VALLE: 1915 what, do you  
21 know?  
22 THE WITNESS: Well, if you will  
23 hand me that book, I will tell you. You've  
24 got an older edition there, incidentally.  
25 MR. VALLE: Well, I am an older

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1 edition myself, so it doesn't really  
2 matter.  
3 MR. KALLEN: Like everything about  
4 this case, nothing has been updated.  
5 THE WITNESS: There is a definition  
6 of competent person which is 1915.4  
7 subchapter, subparagraph O. You want me to  
8 read it?  
9 MR. VALLE: That is all right, we  
10 can find it.  
11 THE WITNESS: And then --  
12 MR. VALLE: The same designation in  
13 the old, as a matter of fact.  
14 THE WITNESS: Okay. I am looking  
15 for the other part because it tells what  
16 they are supposed to know and they are  
17 supposed to be doing.  
18 Okay, here it is. 1915.7 defines a  
19 competent person and subsection C gives the  
20 criteria of what the competent person shall  
21 have been trained in and there are seven  
22 different areas there, basically what I  
23 described previously on these two pages.  
24 BY MR. FAMULARI:  
25 Q. How does one become a shipyard

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1 competent person?  
2 A. Well, according to the OSHA  
3 regulations now in effect they are supposed to  
4 have some training. It doesn't stipulate how  
5 much, how they got it or where they got it. But  
6 it does stipulate that the shipyard is supposed  
7 to post a list of the people who have been  
8 trained and the date of their training so that  
9 obviously says they have to have some training  
10 or you can't post a date.  
11 Normally either the NFPA or the  
12 individual marine chemist give the courses to  
13 train shipyard competent persons. Most of the  
14 courses nowadays are called confined space entry  
15 persons because we also have people who are  
16 trained in shoreside as well as shipside and  
17 then we can cover both in one course because  
18 much of it is very similar.  
19 But basically those are the people  
20 that are trained. OSHA has given some courses,  
21 but they are few and far between and not as  
22 comprehensive as what the marine chemist deal  
23 with because OSHA deals with the regulations and  
24 the marine chemist deals with the real world and  
25 gets into talking about all of the situations

1 and here is what you should or should not do.  
 2 And so usually the marine chemist  
 3 are the fellows that give these courses and I  
 4 have given probably 20, 25 of them over the last  
 5 twenty years.  
 6 Q. Do you know if Bradford Marine had  
 7 shipyard competent persons back in July of 1997?  
 8 A. Yes, they did, and referring to the  
 9 letter that I wrote at that time, I believe they  
 10 had four in the yard who had been trained.  
 11 Q. Did you train them?  
 12 A. I think I trained them all. I  
 13 don't recall for sure, but I think I did.  
 14 I don't think that they all worked  
 15 for Bradford when I trained them because I know  
 16 Dave Henderson worked for Tracor when I trained  
 17 him. He was still working there.  
 18 Q. We are here to talk about the  
 19 explosion that took place in the lazarette area  
 20 on July the 7th of 1997. Are you aware of an  
 21 explosion that took place?  
 22 A. Yes.  
 23 Q. And who called you to come down to  
 24 look at the area after the explosion?  
 25 A. I believe it was Torch, Mark

1 Tortora.  
 2 Q. And what did he ask you to do?  
 3 A. He just asked me to come down and  
 4 he said there had been an explosion and a man  
 5 had been injured and they wanted to determine  
 6 what might have caused the accident.  
 7 Q. Do you recall when you went down?  
 8 I believe the explosion was the afternoon of  
 9 July the 7th.  
 10 Do you know when you went down to,  
 11 do you remember when you went down?  
 12 A. If I can refer to this I am sure  
 13 that I mentioned when I went.  
 14 MR. VALLE: David, if he is going  
 15 to be referring to that during the course of  
 16 the deposition --  
 17 BY MR. FAMULARI:  
 18 Q. Yes, why don't we mark this as the  
 19 next numbered exhibit.  
 20 MR. KALLEN: For the record, that  
 21 has already been marked I think yesterday.  
 22 MR. FAMULARI: Was it?  
 23 MR. KALLEN: That was -- Anyone  
 24 know the exhibit number offhand?  
 25 MR. WEBER: I don't, but I -- we

1 have marked it.  
 2 MR. KALLEN: I'll tell you what it  
 3 is.  
 4 MR. WEBER: Yes, 17.  
 5 MR. KALLEN: Okay, let's refer to  
 6 it as 17 then.  
 7 BY MR. FAMULARI:  
 8 Q. 17, okay.  
 9 A. Well, I wrote the letter on the 8th  
 10 of July and the incident occurred on the 7th in  
 11 the afternoon, so I must have gone over there on  
 12 the 8th.  
 13 That would be my conclusion. It  
 14 doesn't state on here exactly when I went, but  
 15 having written the letter the next day I must  
 16 have gone the next day.  
 17 Q. And the letter that you are  
 18 referring to is for the record what has been  
 19 previously marked as Exhibit 17?  
 20 A. That is correct.  
 21 Q. Do you recall what you did when you  
 22 went down to inspect the vessel?  
 23 A. Yes, I went down and first thing  
 24 that I did is I took my multi gas tester and I  
 25 tested for oxygen gas levels or explosive gas  
 1 levels.  
 2 I recall that I didn't find any,  
 3 but that wasn't anything that I would have  
 4 expected to find because after the explosion I  
 5 understand the part of the vessel went  
 6 underwater and that would have displaced any  
 7 gases I you would have found anyway.  
 8 I looked around visually and didn't  
 9 see any slicks or anything of any kind of a  
 10 hydrocarbon that may have caused this.  
 11 After that I questioned some of the  
 12 people from the yard and I think the captain as  
 13 to what might have been stored in the area,  
 14 various things like that and talked to the yard  
 15 people about what they were doing and so on.  
 16 Just generally trying to find out as much as I  
 17 could to help come up with any kind of  
 18 conclusions because I didn't find any evidence  
 19 at the time as to what might have caused this.  
 20 Q. When you looked around down where  
 21 the explosion took place, did you see any burn  
 22 marks any place?  
 23 A. No.  
 24 Q. Any soot marks?  
 25 A. No.

1 Q. Is that common, unusual or whatever  
 2 when an explosion takes place?

3 A. This is the first explosion that I  
 4 have ever examined, so I couldn't tell you.

5 I have been involved with fire  
 6 investigations, but fire is different than an  
 7 explosion. I don't believe that there was any  
 8 fire that broke out at the time of this  
 9 incident.

10 Q. You mentioned earlier about a multi  
 11 testing gas meter. Could you explain to us what  
 12 that is?

13 A. Well, there are a number of  
 14 instruments on the market that are used by  
 15 various trades including marine chemists to  
 16 determine oxygen content, explosive levels of  
 17 the atmosphere, if that is present, and/or  
 18 levels of other gases that the instrument may be  
 19 set up to look for, being things like carbon  
 20 monoxide, hydrogen sulphide and things like that  
 21 and that meter has a hose on it where you put  
 22 the hose into an area that you want to test,  
 23 pull a sample in, into the meter and it reads  
 24 out either with a meter or digitally. My  
 25 equipment is digital, that would tell us if

1 those gases are present and, of course, if  
 2 oxygen is present which is needed for breathing.

3 Q. How big is the hose that comes off  
 4 the unit?

5 A. I would say the inside diameter is  
 6 probably an eighth of an inch.

7 Q. What is the outside diameter, if  
 8 you know?

9 A. Maybe a quarter inch. It's just a  
 10 piece of Tigon tubing that runs to the  
 11 instrument, to the pump, you know, something  
 12 that will bring the gases into the meter from  
 13 wherever you want to throw the hose.

14 Q. Does it take any kind of special  
 15 training to use one of the meters?

16 A. They are pretty easy to use, but  
 17 frequently when we give the courses people who  
 18 haven't used one before need some training in  
 19 them just to understand what they are doing, why  
 20 they are doing it and how to know if they are  
 21 working right before they start using them.

22 Q. At the time that you looked at the  
 23 vessel after the explosion and wrote the report,  
 24 did you come to any conclusions about what might  
 25 have ignited or been the source of the

1 explosion?

2 A. No.

3 MR. VALLE: Objection to the form.

4 BY MR. FAMULARI:

5 Q. I note in your report you mentioned  
 6 something about some, being told some acetone  
 7 had been spilled, do you recall that?

8 A. Yes, I made some guesses as to what  
 9 were possibilities. I don't believe that I came  
 10 to any conclusions because I had no evidence  
 11 from which to make those conclusions, but I  
 12 believe that at one point the captain or  
 13 someone, maybe one of the crew members had  
 14 mentioned that there had been a can of acetone  
 15 that might have been spilled down in that area.

16 I believe also we discussed the  
 17 possibility that some red gasoline cans for  
 18 outboard motors might have been down there.

19 Those are the only substantive  
 20 things that I could come up with. There are  
 21 other things that I wrote in this letter that  
 22 were possibilities, but I have no evidence one  
 23 way or the other about them.

24 Q. From what you observed and from  
 25 what you were told about the vessel before the

1 explosion took place, could you describe to us  
 2 what your ideas of the configuration of that,  
 3 what was below the subfloor in that lazarette  
 4 area?

5 A. Okay. Well, the lazarette shell  
 6 plating is aluminum along with the structural  
 7 and into that area was poured some cement. And  
 8 this came up to within an inch or two of the top  
 9 of the structurals.

10 Over top of that was then put some  
 11 aluminum plates and I don't remember whether it  
 12 was welded down or not, but there were some  
 13 aluminum plates above that enclosed that air  
 14 space above the concrete or cement and the  
 15 entire bilge area. And then on top of that  
 16 since the plate was flat, there was storage.

17 When I got there all of that had  
 18 been cleaned out because they were getting ready  
 19 to do some modifications, so there was nothing  
 20 stored in there at the time that I was there.

21 Three to four feet above that was  
 22 the cockpit deck, fishing cockpit deck and above  
 23 that the fishing cockpit with the, at the  
 24 forward end wooden drawers and so on for storing  
 25 fishing equipment.



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1 Q. Do you recall if the space between  
2 the deck and the lazarette and the skin of the  
3 vessel that you just described, do you recall if  
4 that was vented at all?

5 MR. KALLEN: Let me object to the  
6 form. What space are you referring to  
7 specifically?

8 BY MR. FAMULARI:

9 Q. The space below the floor of the  
10 lazarette, between the cement and the floor of  
11 the lazarette?

12 A. I don't recall whether there was  
13 any specific ventilation provided. It would be  
14 -- I would be surprised if there were, let's  
15 put it that way.

16 Q. You would be surprised if it was  
17 vented?

18 A. Yes.

19 Q. Why is that?

20 A. There is really -- It is not -- it  
21 is not common practice to ventilate an area  
22 between a floor and a bilge area in a lazarette.

23 Q. What about if --

24 A. There wouldn't be any reason to  
25 want to put a blower in there.

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1 Q. Say hypothetically that the floor  
2 of the lazarette covered this space, that  
3 covered the space was seam welded and it was  
4 completely sealed creating a completely sealed  
5 area, would there be any reason to vent it in  
6 that case?

7 MR. VALLE: Objection to form.

8 THE WITNESS: Not that I know. No,  
9 not that I know of.

10 BY MR. FAMULARI:

11 Q. Okay, getting back to the report.  
12 So at the time in 1997 when you looked at the  
13 vessel you didn't come up with anything, any  
14 conclusions about what was the source of  
15 ignition here?

16 A. No, no, not at that time.

17 Q. Have you been back on the vessel  
18 since?

19 A. I was back there a month ago  
20 approximately.

21 Q. Why were you back on the vessel a  
22 month ago?

23 A. They were making some modifications  
24 to the vessel and doing welding in and around  
25 fuel tanks and that lazarette and the yard that

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1 called me in as required by OSHA regulations to  
2 certify it before they did the welding.

3 Q. Since you wrote that report or that  
4 letter to Mr. Engle on July the 8th of 1997,  
5 have you come to any conclusions about what may  
6 have caused this explosion?

7 A. Well, yes, one possible conclusion,  
8 and this is a result of a few weeks later going  
9 to one of our annual marine chemist conventions  
10 and discussing the situation there, because I  
11 was as we do sitting around talking with other  
12 chemist, well, what is new, what has happened,  
13 whatever, and in talking with some of the other  
14 fellows there they mentioned something that  
15 hadn't occurred to me at the time.

16 And that was when you put cement  
17 against aluminum the chemicals in the cement in  
18 conjunction with the aluminum will create  
19 hydrogen gas. And my suspicion that the most  
20 probable cause of this explosion would have been  
21 hydrogen gas because of the cement against the  
22 aluminum.

23 It wouldn't have created any kind  
24 of a smoke or anything like that. It is a clean  
25 explosion. If you recall from high school

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1 chemistry class, every high school chemistry  
2 teacher at one time has put some hydrogen into  
3 something and sparked it in conjunction with the  
4 air and you get an explosion but you never see  
5 any smoke or anything, but, of course, it is a  
6 very striking demonstration of a chemical  
7 reaction.

8 And my suspicion is that is most  
9 likely what happened, but I again have no proof  
10 or any way to substantiate that other than the  
11 fact that the chemical reaction between the  
12 aluminum and the concrete is known or cement is  
13 known.

14 Q. Would the hydrogen gas explosion in  
15 this situation have been powerful enough to  
16 cause the damage that occurred in this case?

17 MR. VALLE: Objection to the form.

18 No predicate as well.

19 BY MR. FAMULARI:

20 Q. You can answer if you can.

21 A. Probably. If that entire space had  
22 hydrogen under it or a good portion of it, it is  
23 a very powerful explosion and it would easily  
24 have, could have created the damage that I saw.

25 Q. If that area had some kind of vents

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1 put in it when the vessel was constructed would  
2 gas still build up in there?  
3 MR. VALLE: Objection to the form.  
4 MR. KALLEN: Join.  
5 THE WITNESS: Probably not, but I ✓  
6 can't say one way or the other. It just  
7 depends on how well it was ventilated.  
8 The area was highly segmented, so  
9 ventilation in one corner may not have  
10 ventilated the entire floor anyway. It's  
11 difficult to say.  
12 BY MR. FAMULARI:  
13 Q. Do you remember what the area  
14 looked like in the lazarette with the hatches on  
15 the top and the open space underneath.  
16 Do you have any recollection of  
17 what it looked like?  
18 A. When?  
19 Q. When you went to --  
20 A. When I went to inspect it?  
21 Q. Yes, when you went to inspect it?  
22 A. I remember the cockpit deck area at  
23 the storage drawers in the forward end was  
24 heaved up and I remember seeing cracks there.  
25 I remember seeing some of the floor

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1 curled up, but at this point I couldn't tell you  
2 exactly how it looked. I know there were photos  
3 taken at the time and I didn't pay much  
4 attention to that other than the fact that I do  
5 recall seeing the floor heaved up and kind of  
6 rolled back like a tuna can, if I recall.  
7 But I couldn't tell you more than  
8 that.  
9 Q. Did you take photos at the time?  
10 A. No, I didn't. Photos had been  
11 taken and I had no reason to.  
12 Q. Do you know who took the photos?  
13 A. I think Mark Tortora did.  
14 Q. With the hatches off the top of  
15 that space --  
16 A. You are talking on the cockpit  
17 deck?  
18 Q. On the cockpit deck --  
19 A. Yes.  
20 Q. -- That would have exposed, given  
21 access to that lazarette area, as a marine  
22 chemist would you have considered that a  
23 confined space?  
24 MR. KALLEN: Object to the form.  
25 MR. VALLE: Join.

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1 THE WITNESS: Yes.  
2 MR. VALLE: I am sorry, what space  
3 are we talking about?  
4 MR. VALLE: Read the question  
5 back.  
6 (Thereupon, the above-mentioned  
7 question was read by the reporter as above  
8 recorded.)  
9 MR. VALLE: Object to form.  
10 MR. FAMULARI: What I am trying to  
11 get is an opinion from him as, because we  
12 have talked to other people about what is a  
13 confined space.  
14 MR. VALLE: Yeah, but I am not sure  
15 what you are talking about. Are you talking  
16 about the area between the wooden deck and  
17 the aluminum deck?  
18 MR. FAMULARI: Yes, I am talking  
19 about the area between the wooden deck and  
20 the aluminum deck, not the subspace.  
21 MR. KALLEN: David, let me clarify  
22 my objection so maybe you can clean it up.  
23 MR. FAMULARI: Okay.  
24 MR. KALLEN: I don't think it has  
25 been established as a predicate. We know

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1 there were hatches on the cockpit deck for  
2 entry into the lazarette.  
3 I don't know if it has been  
4 established how many of those hatches were  
5 actually off and whether that makes a  
6 difference as to the definition of a  
7 confined space.  
8 THE WITNESS: It doesn't.  
9 MR. KALLEN: Okay, well --  
10 THE WITNESS: The definition is in  
11 there.  
12 MR. KALLEN: Right.  
13 BY MR. FAMULARI:  
14 Q. Why don't you tell us what the  
15 definition of a confined space is.  
16 A. The definition of a confined  
17 space?  
18 MR. KALLEN: I was just looking at  
19 it. Where was it? Here it is. Why don't  
20 you read off the section first.  
21 THE WITNESS: This is 1915.4  
22 paragraph P. "The term confined space" --  
23 this is OSHA's definition, "means a  
24 compartment of small size and limited access  
25 such as a double bottom tank, cofferdam or

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1 other space which by its small size and  
2 confined nature can readily create or  
3 aggravate a hazardous exposure."

4 Now, when I teach the course we  
5 extend that a little bit. We say it's  
6 normally any space that is not designed for  
7 normal human use. So when I say normal  
8 human use being you don't live there, you  
9 don't go into it on a regular basis. It is  
10 -- an enclosed space is a slightly  
11 different definition and that is a space  
12 that would be ventilated and used more  
13 often. A space that is regularly opened  
14 and ventilated would be like an enclosed  
15 space. A confined space would be a space  
16 that may or may not be ventilated, but it  
17 isn't something where someone goes into it  
18 regularly.

19 Very minute distinction between the  
20 two, but OSHA chooses to have the two  
21 different definitions and we just try and  
22 deal with them both as marine chemists in  
23 teaching the course.

24 BY MR. FAMULARI:

25 Q. If there was a confined space and

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1 there was going to be hot work done what should  
2 be done? What should the shipyard competent  
3 person and/or the welder do?

4 A. Well, first of all, they have to  
5 determine where it is located relative to fuel  
6 tanks or other spaces that have, may have  
7 contained flammable work or combustible liquid  
8 because if it is an adjacent space to one of  
9 those spaces they are required to call a marine  
10 chemist if their work is within twenty-five feet  
11 of that space.

12 If that is not the case, if that is  
13 not the case then anybody entering that space  
14 prior to entering from a shipyard standpoint  
15 that space should be tested for oxygen,  
16 combustible or flammable gases to see if they  
17 were present.

18 And if they are not -- if oxygen is  
19 there, but the flammable gases aren't there,  
20 according to the OSHA regulations there are  
21 limits with numbers and all of this and I won't  
22 go into the whole course on that.

23 If the numbers are what they are  
24 supposed to be, then a competent person is  
25 permitted to let someone go into the space.

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1 Now, prior to hot work in addition  
2 to that a person should be writing what is  
3 called a competent person's log which would list  
4 that that space has been inspected and what type  
5 of work is permitted to be done there, any  
6 limitation that should be done on that same  
7 competent person's log. The time and date of  
8 the inspection should be there.

9 Any instruments that are used to  
10 test the space should be written down and any  
11 results of those tests such as the oxygen level,  
12 LEL, the explosive limits of the gases found.

13 Again, it is all spelled out in  
14 part of the course that is taught. It gets a  
15 little bit, how should I say, detailed I guess  
16 is what should be done, but basically those are  
17 the things that should be done before someone is  
18 told, yes, it is safe to go in and do the work.

19 Someone is supposed to look at the  
20 space, either a competent person or a marine  
21 chemist and test the area that is supposed to be  
22 welded in as well as consideration given to  
23 adjacent spaces and, of course, anything on the  
24 opposite side of any place that is being welded  
25 on because that common plate is common to two

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1 spaces.

2 In other words, if you are on one  
3 side of a plate, whatever is on the other side  
4 is another space and it has hot work being done  
5 on it by nature of the fact that that plate is  
6 being heated up to whatever temperature.

7 So at least two spaces have to be  
8 examined anytime that you are doing work on a  
9 piece of aluminum or a plate or a piece of steel  
10 or whatever.

11 Probably the most notable exception  
12 would be if you are inside the ship and you are  
13 welding on the outside, as long as someone has  
14 looked around and made sure there is no gasoline  
15 tanks right next to the outside of the vessel,  
16 you don't really examine and run around looking  
17 the whole yard because that is adjacent to the  
18 outside.

19 Q. Let's assume --

20 A. You got to use some logic.

21 Q. Let's assume that --

22 MR. VALLE: Can you read that  
23 entire answer back for me.

24 (Thereupon, the above-mentioned  
25 question was read by the reporter as above



1 recorded.)  
 2 MR. VALLE: What I was confused  
 3 about was that whether or not the adjacent  
 4 space or the space that they were working in  
 5 was what you were referring to, and when you  
 6 said that it should be tested. And you lost  
 7 me a little bit there. That was my  
 8 confusion, I am sorry.  
 9 BY MR. FAMULARI:  
 10 Q. If you want to take it, clarify  
 11 that, go head?  
 12 A. Well, if you are welding on a space  
 13 that has an adjacent space that needs to be  
 14 tested, you have to test both spaces.  
 15 I think I went into that at the end  
 16 there when I was talking about if you're welding  
 17 on a plate and you're welding on this side, this  
 18 side is involved, therefore you have to test  
 19 this as well.  
 20 MR. VALLE: Okay. Would that be  
 21 the responsibility of the marine competent  
 22 person or --  
 23 THE WITNESS: Either the competent  
 24 person of the marine chemist depending on  
 25 who --

1 MR. VALLE: Who is there?  
 2 THE WITNESS: -- Who is supposed to  
 3 be there for it, yes.  
 4 MR. VALLE: Okay.  
 5 BY MR. FAMULARI:  
 6 Q. Okay, let's assume that the  
 7 lazarette is a confined space and that it is 25  
 8 feet from fuel tanks.  
 9 MR. KALLEN: More than 25 feet?  
 10 BY MR. FAMULARI:  
 11 Q. More than 25 feet. We are assuming  
 12 that because I don't really know. And let's  
 13 also assume that the welder, the actual person  
 14 that was going to do the work asked the captain  
 15 if there were any fuel lines or hydraulic lines  
 16 underneath that deck and was told no, and let's  
 17 assume that the welder was told that the area  
 18 below was filled with cement up to the top and  
 19 the deck was laid on top of that where he was  
 20 going to weld.  
 21 Let's assume all of that. At that  
 22 point what should the shipyard competent person  
 23 do?  
 24 MR. VALLE: Objection to the form.  
 25 MR. KALLEN: Join.

1 THE WITNESS: He is still required  
 2 to inspect the space in which there is  
 3 welding and -- You are saying we are  
 4 assuming the cement was right up to the  
 5 plate?  
 6 BY MR. FAMULARI:  
 7 Q. Yes?  
 8 MR. VALLE: Assuming he was told?  
 9 BY MR. FAMULARI:  
 10 Q. Assuming he was told that, yes,  
 11 assuming he was told that?  
 12 A. It would be up to him to verify  
 13 that is the case, that there is no space there.  
 14 And at that point he would either  
 15 find a space or not and at some point figure out  
 16 how to test that on the opposite side of the  
 17 plate if there is a space there by drilling a  
 18 hole.  
 19 If there isn't a space there they  
 20 may have called me on the phone and said, geez,  
 21 we are going to weld right against a piece of  
 22 cement on the opposite side of this, what do we  
 23 need to worry about? They may or may not have  
 24 done that.  
 25 I get calls not necessarily about

1 cement, but from time to time about here is a  
 2 situation that is unusual, Pete, what should we  
 3 do. So at that stand, from that stand point he  
 4 should have looked at the area and determined  
 5 whether it was safe using a meter and visual  
 6 inspection on both sides of the plate that was  
 7 to be welded.  
 8 Q. And who should have been the one to  
 9 make that determination?  
 10 A. The shipyard competent person.  
 11 Let me back up something that you said a minute  
 12 ago for clarification of you all.  
 13 Q. Okay.  
 14 A. You said if there is a fuel tank  
 15 further away than 25 feet.  
 16 Okay, this is something that  
 17 probably wasn't described earlier and I didn't  
 18 go into it in detail, but maybe I should so  
 19 there isn't a misconception. And that is if  
 20 there is a fuel tank closer than 25 feet, but  
 21 you are working not in an adjacent space, two  
 22 spaces away, that fuel tank could be three feet  
 23 away and this space is not required to be  
 24 inspected.  
 25 It is only if you are in an

1 adjacent space to a fuel tank that you have to  
2 be more than 25 feet away. So if you have  
3 cofferdams and various things like that and you  
4 are two spaces away, that 25 foot exception  
5 doesn't come into play.

6 I didn't want someone to  
7 automatically think all fuel tanks have to be 25  
8 feet away no matter what is in between or else  
9 someone broke the law. That isn't the case.

10 Q. In your work as a marine chemist  
11 over the last 20 years do you sometimes review  
12 the drawings of a vessel to, in your work to  
13 determine what tanks are where and where voids  
14 are and things like that?

15 A. Yes.

16 Q. Do you recall if you ever looked at  
17 any plans on the SOUVENIR before you certified  
18 the hot work on those forward fuel tanks?

19 A. I don't believe that I did.

20 Q. When you are teaching courses to  
21 the shipyard competent, to make people shipyard  
22 competent, do you ever discuss with them the  
23 reviewing of plans of the vessel and to give  
24 them information to make their decision?

25 A. We never discuss that

1 specifically. I frequently will have a  
2 blackboard and we will draw things and say,  
3 okay, no, you got to look here and there and so  
4 on for demonstration purposes.

5 On larger vessels the plans are  
6 hanging on a bulkhead or hanging in a hallway  
7 somewhere and it's real easy to just walk up to  
8 them and just look when you say to the chief  
9 engineer or the chief mate where are you going  
10 to work, and sometimes it's easier for them to  
11 say come on out here and I'll show you before we  
12 go down and start crawling around so that I have  
13 an idea of the configuration.

14 On a yacht much of the time they  
15 don't have the plans, but the configuration is  
16 usually much more straightforward and they  
17 usually aren't required or necessary for me to  
18 do my work.

19 And we assume the same for the  
20 shipyard, that since they are more simply and  
21 more straightforwardly designed than a large  
22 ship, that the people are capable of determining  
23 what is where without the plans.

24 Q. I asked you this before. Getting  
25 back to the acetone theory, would an explosion

1 with acetone cause any kind of burn marks or  
2 sooting?

3 MR. VALLE: Objection to the form.

4 MR. KALLEN: Join.

5 THE WITNESS: I couldn't answer  
6 that. I don't know.

7 BY MR. FAMULARI:

8 Q. What about if it was a gasoline  
9 based explosion?

10 MR. VALLE: Objection to the form.

11 MR. KALLEN: Join.

12 THE WITNESS: I don't know, to be  
13 honest with you.

14 BY MR. FAMULARI:

15 Q. In your work as a marine chemist do  
16 you ever deal directly with the welders?

17 A. All the time.

18 Q. Did you ever talk to Henry Naranja  
19 before or after this explosion?

20 A. I don't believe so. I may have in  
21 the yard at some time on another job, but not in  
22 any relation to this.

23 Q. In this particular case is there  
24 anything, do you have an opinion on anything  
25 that Henry Naranjo as the welder should have

1 done that he didn't do in this instance?

2 MR. VALLE: Objection form of the  
3 question.

4 MR. KALLEN: Join.

5 MR. VALLE: Objection, no  
6 predicate.

7 THE WITNESS: Yes.

8 BY MR. FAMULARI:

9 Q. What is that?

10 A. He should have made sure that  
11 someone had looked at the area that he was going  
12 to work in before he started. From the yard,  
13 that is. A competent person or -- And asked  
14 them is it safe.

15 I don't know whether he did that or  
16 not. But that is the thing that he should have  
17 done and whenever I am talking with welders the  
18 one thing that I, that I always tell them and  
19 this has nothing to do with whether or not  
20 anybody inspected it is, I always tell the  
21 welders make sure that you know what is on the  
22 other side of what you are welding and if you  
23 don't know don't weld.

24 I don't know whether I have ever  
25 told him that specifically, but whenever I am

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1 talking with welders or talking with people in  
2 the yard and have a few minutes I am constantly  
3 trying to spread this word because of the  
4 stories that I hear from other marine chemists  
5 and, of course, after the fact this incident.

6 I am the only guy in the area that  
7 gets to teach this kind of stuff. OSHA writes  
8 the regs, but they don't make any provisions so  
9 I am forever -- I am like the gospel spreader,  
10 you know. That is what I do when I go out to  
11 the yards and --

12 I have people look up at me, are  
13 you sure it is safe. Off the record.

14 (Discussion off the record.)

15 THE WITNESS: But, anyway, I mean,  
16 that is how I get them to have some  
17 confidence in me, you know.

18 BY MR. FAMULARI:

19 Q. I don't have anything else.

20 CROSS-EXAMINATION

21 BY MR. KALLEN:

22 Q. Mr. Rimmcl, let me follow up on  
23 that last question posed to you by Mr. Famulari  
24 about what Mr. Naranjo, or I take it any welder  
25 in this circumstance should have done in your

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1 opinion when faced with a welding job in a  
2 confined space --

3 A. Right.

4 Q. -- On this boat. You said that he  
5 should have made sure what was on the other  
6 side?

7 A. Right.

8 Q. Now, in your opinion as a welder  
9 what should he have done to make sure what was  
10 on the other side?

11 A. The easiest answer is talk to his  
12 boss.

13 Q. Okay. Would it be adequate in your  
14 opinion for him to simply ask the captain of the  
15 vessel as opposed to his employer who is  
16 responsible for the work?

17 A. No, because it's good to ask the  
18 captain about specific things such as in the  
19 question are there hydraulic lines, et cetera.  
20 The more information that you get the better, of  
21 course.

22 Q. Sure.

23 A. But you don't know whether that  
24 captain has had competent person training. He  
25 obviously is not working for the yard and hasn't

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1 had safety training in the types of areas where  
2 he is supposed to be looking for hazards.  
3 Q. Okay. And I take it from your  
4 testimony today that if there be any doubt as to  
5 what may be behind the deck or on the other side  
6 of the deck or any doubt as to the presence or  
7 possible presence of combustibles or any doubt  
8 as to the presence of any other potential risk  
9 relative to the welding job to be undertaken,  
10 the welder and his supervisor should error on  
11 the side of caution and ask and get as much  
12 information as possible before starting the job,  
13 would that be fair to say?

14 A. Yes. I might mention --

15 Q. Sure.

16 A. In my competent person course I  
17 have a clipboard with big pages of paper on it  
18 and one of them is if you walk away from a job  
19 and you still have doubts, you haven't done your  
20 job; go back.

21 Q. Okay.

22 A. Now, this is for the competent  
23 person. The welders don't always go to these  
24 classes.

25 Q. No, I understand that.

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1 A. So, you know --

2 Q. And let me follow up on that since  
3 you mentioned it.

4 At some point in time should not  
5 the welding foreman or some supervisor at the  
6 yard make sure that the individual welders have  
7 a working knowledge of, if not the OSHA  
8 regulations themselves, the potential hazards  
9 involved on the job which OSHA speaks to so they  
10 can identify these risks before the job  
11 commences?

12 A. That is -- Yes, that is true, yes.

13 Q. Would you expect a welder who has  
14 been on the job at a yard such as Bradford for  
15 six, seven years and has had welding experience  
16 before that to at least have a working knowledge  
17 of the potential hazards of doing welding work  
18 on a ship?

19 A. Pretty much so, yes.

20 Q. And to that extent the welder  
21 himself would bear some responsibility to look  
22 after his own safety before commencing a welding  
23 job?

24 A. Yes.

25 MR. FAMULARI: Object to the form.

1 BY MR. KALLEN:

2 Q. I take it that in addition to the  
3 OSHA regulations that would be applicable to  
4 this situation we would also be dealing with  
5 NFPA guidelines or regulations, however you want  
6 to nominate them?

7 A. In what regard?

8 Q. Well, I am familiar with NFPA 51 B,  
9 for example, dealing with welding and I have the  
10 '99 edition. 51 B is standards for fire  
11 prevention during welding, cutting and other hot  
12 work.

13 A. Yes, right.

14 Q. Would that -- I will show it to  
15 you?

16 A. I have read this off and on for  
17 years, but I am trying to remember which one  
18 this is.

19 Q. Let me show it to you. And again  
20 for the record I am showing you the '99 edition,  
21 so I can't represent that it is one hundred  
22 percent the same as the one in effect in 1997.

23 A. This is a standard put out by  
24 NFPA. It is a good reference, but it's not an  
25 obligatory standard.

1 individuals would have been incorporated into  
2 your letter of July the 8th?

3 A. That is correct.

4 Q. And that is the only report that  
5 you prepared with respect to the post  
6 explosion --

7 A. Yes.

8 Q. -- Involvement?

9 A. Yes.

10 Q. Yes?

11 A. Yes.

12 Q. Let me ask you a couple of specific  
13 questions. When Mr. Naranjo was doing this  
14 welding job in the lazarette did that call for  
15 the placement of a fire blanket on the deck?

16 A. I don't know why it would.

17 Q. Okay. I am just asking?

18 A. No, no.

19 Q. Because I know the OSHA regs and  
20 NFPA do speak to the use of fire blankets, but,  
21 I'm --

22 A. That is basically in areas where  
23 you are welding, where an area beneath where you  
24 are welding may have flammable things like oil,  
25 sludge, dunnage, whatever and if you are doing a

1 Q. But it is a guideline --

2 A. That is correct.

3 Q. -- Which, and there are reasons why  
4 this is published?

5 A. That is their business. They  
6 publish many, they publish many different  
7 standards relating to many areas of industry and  
8 this is one that they take seriously.

9 Q. Okay, and I believe in fact the  
10 OSHA regs make reference to NFPA in certain  
11 respects?

12 A. In various areas they do, yes,  
13 including, the marine chemist regulations for  
14 certain areas of the standard.

15 Q. Do you have an actual file with  
16 respect to your investigation of this explosion?

17 A. No, I don't.

18 Q. Do you have any handwritten notes  
19 of conversations that you may have had with yard  
20 personnel or the vessel when you were out there  
21 after the explosion?

22 A. I did when I wrote the letter. I  
23 don't any more.

24 Q. Any pertinent information that you  
25 may have obtained from speaking with these

1 small job it's easier to put a blanket there  
2 than spend a day trying to clean it up.

3 The blanket catches the slag that  
4 falls instead of it going down and starting a  
5 fire. That is normally the type of thing.

6 Q. What if you have a potential  
7 combustible vapor or gas underneath?

8 A. A blanket wouldn't do you any good. ✓

9 Q. Okay, fine. So the blanket isn't  
10 designed to say catch any sparks or heat and  
11 prevent those sparks and heat from emanating  
12 through the deck that you are welding into, the  
13 space?

14 A. No, it wouldn't do that.

15 Q. What about a fire watch in this  
16 instance?

17 A. Well, it's always recommended to  
18 have a fire watch when anybody is welding  
19 because the man who is doing the welding has a  
20 mask on and he is concentrating on where he is  
21 welding. He can't see where slag or sparks can  
22 be going.

23 So general shipyard practice is to  
24 have a fire watch when someone is welding to  
25 make sure that the welder's hindsight is

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1 covered, so to speak.  
 2 Q. Sure. And that is to protect not  
 3 only the welder who can't see around him, he is  
 4 focussing on the weld, but also protect the  
 5 property as well?

6 A. Of course, of course.

7 Q. Did I hear you correctly that  
 8 recently you were on this boat?

9 A. With a new name, yes.

10 Q. With a new name. And you were  
 11 there to inspect and certify the lazarette area  
 12 before welding was done in this lazarette?

13 A. Yes.

14 Q. Are we talking about the same  
 15 space?

16 A. Yes.

17 Q. And you were called out on this  
 18 occasion to inspect the lazarette area?

19 A. They called me to inspect the areas  
 20 adjacent to the fuel tanks where they were  
 21 welding and in the course of conversation I said  
 22 where else are you welding.

23 Q. Right.

24 A. And they mentioned they are welding  
 25 all the way to the transom in the boat. I said,

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1 well, what is back there and through the  
 2 conversation I found out it was this boat and I  
 3 said, well, we need to deal with that.

4 And that is how I found out about  
 5 it, because they wouldn't have called me I don't  
 6 believe just for the lazarette.

7 MR. VALLE: Why bother.

8 MR. KALLEN: Yes.

9 THE WITNESS: Just like they would

10 -- it's not a space that I would be  
 11 required by OSHA regulations to inspect.

12 So, had they only worked in that area they  
 13 wouldn't have called me.

14 BY MR. KALLEN:

15 Q. Okay. The lazarette has since been  
 16 modified and changed from the way that it was  
 17 laid out at the time of this explosion, are you  
 18 aware of that?

19 A. The cement is still there. I  
 20 believe what I specified we do, we did cut some  
 21 or they did, cut some ventilation holes  
 22 throughout much of the area.

23 I try to convince them to take the  
 24 cement out and put a different kind of ballast  
 25 in there and the owner when he found out what it

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1 was going to cost to get the cement out of there  
 2 timewise and so on opted not to do that. And I  
 3 just told the captain, well, just remember that  
 4 you got cement against aluminum, you still have  
 5 the same potential hazard that you had at the  
 6 time of this incident.

7 Q. As far as checking the opposite  
 8 side of this particular deck let's say, not now  
 9 but at the time, I believe you made a reference  
 10 to drill a hole through the deck and see what is  
 11 underneath?

12 A. Drill a hole through the deck,  
 13 stick a hose in there and check it with a meter  
 14 and first put your hose in and pull it out and  
 15 make sure it's not wet.

16 Q. That is a prudent thing to do?

17 A. Yes, yes, that is, and then if it  
 18 comes out dry you put it back in and you check  
 19 to see if there is anything in there that might  
 20 read in your meter.

21 Q. Okay, I will pass you to Mr.  
 22 Valle.

23 RE-CROSS-EXAMINATION

24 BY MR. VALLE:

25 Q. Well, the 64 thousand dollar

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1 question to me at this point is when you  
 2 investigated that or when you went to the ship a  
 3 month ago and you looked at the area adjacent to  
 4 where the fuel tanks were and then I take it  
 5 your memory was triggered as to, hey, this is  
 6 the boat that in '97 there was an explosion,  
 7 correct?

8 A. Yes.

9 Q. And you asked them are you also  
 10 welding in the area of the lazarette and they  
 11 responded that they were?

12 A. Yes.

13 Q. Did you physically go to the  
 14 lazarette?

15 A. Yes, I did.

16 Q. And what did you do while you were  
 17 there?

18 A. I looked to see what the structure  
 19 was and what was in there and said you are going  
 20 to have to deal with this. You are going to  
 21 have to clean this stuff out of here, pull the  
 22 plates up so we don't have an area where there  
 23 could be trapped hydrogen.

24 Q. What was in the area when you were  
 25 there?



1 A. There were some plates covering the  
2 same deck frames leaving that one to two inch  
3 space as previous. They were loose plates, I  
4 recall.  
5 I don't, like I said earlier, I  
6 don't recall earlier whether the other plates  
7 had been tacked down or welded down, I just  
8 don't remember.  
9 Q. Okay.  
10 A. But these plates were in smaller  
11 pieces. They could be picked up and they were  
12 -- with a few exceptions because there was  
13 equipment bolted to them and they were down  
14 where they couldn't pick the pieces up. The  
15 new plates were then picked up and moved out of  
16 the way so the area could be ventilated and  
17 based on the work that they had to do we put  
18 some blowers in to blow underneath the other  
19 plates to make sure there was no residual  
20 hydrogen there, if there was any buildup.  
21 I did test with my meter and got no  
22 readings.  
23 Q. That is what I wanted to ask you?  
24 A. Yes.  
25 Q. Direct question, okay. At the time

1 that you were there did you use your multi gas  
2 tester to check the one inch gap between the  
3 bottom, between the floor of the lazarette and  
4 the top of the cement to determine whether or  
5 not or to try to determine --  
6 A. Yes, I did.  
7 Q. -- Whether there was any  
8 combustible gases in there?  
9 A. Yes, two different dates.  
10 Q. When you did that was the area  
11 opened up or was it still confined so that you  
12 would expect that if, that if there were  
13 explosive gases in there you would have found  
14 them?  
15 A. The first time that I went there it  
16 was, the plates were still on the deck.  
17 Q. Okay.  
18 A. And I checked a couple of areas  
19 with my meter and didn't find any hydrogen.  
20 There were holes that were drilled  
21 through the ends through which I put my meter  
22 hose and I don't believe that those were there  
23 at the time of this incident.  
24 Q. You knew that they did drill holes  
25 on the deck before the incident occurred?

1 A. They drilled a hole on the top  
2 plate of the deck, yes.  
3 Q. Okay.  
4 A. What I am saying is, at the aft end  
5 of some areas of the lazarette there were holes  
6 drilled through the frames or through some  
7 structure. I am trying to remember, and I stuck  
8 my meter in a couple of those to test underneath  
9 the plates that way. We didn't drill any holes  
10 specifically.  
11 Q. Okay.  
12 A. I found nothing at that point.  
13 Q. Correct me if I am wrong, but  
14 hydrogen is lighter than air, is it not?  
15 A. Yes.  
16 Q. And if hydrogen was going to be  
17 generated by cement in contact with aluminum  
18 underneath those deck plates, you would expect  
19 that hydrogen to rise and be directly underneath  
20 the deck plate, correct?  
21 A. Yes, I guess, yes.  
22 Q. And that is why you tested it,  
23 isn't it? I mean, that is why you put the hose  
24 in there to see --  
25 A. Yes.

1 Q. -- Hey, if we got a situation here  
2 that we might have had three years ago?  
3 A. Correct.  
4 Q. And in your testing that was done a  
5 month ago you found no presence of any hydrogen  
6 gas at all underneath those deck plates between  
7 the cement plate and the bottom of the deck  
8 plate which is the floor of the lazarette?  
9 A. Correct.  
10 Q. Okay, did you find anything else,  
11 any other type of gas, any other type of  
12 combustible?  
13 A. Nothing combustible, no. There ✓  
14 was a difference -- like I say, these plates  
15 were loosened and they were just laying on top  
16 of the frames. I know that the other plates  
17 were solid plates.  
18 Like I said, I don't remember  
19 whether they were welded down, but they were  
20 much larger plates and that, that is the only  
21 thing that I can recall but they would, could ✓  
22 have combined hydrogen in a space that because  
23 there would be no air movement or way for it, a  
24 way to ventilate.  
25 That is the only difference that I

1 did find this time, that they were smaller  
2 plates and we were able to pick them up and move  
3 them.

4 Q. If hydrogen gas is continually  
5 generated by this reaction between aluminum and  
6 cement, in your experience, sir, as a marine  
7 chemist would you expect that there would be a  
8 trace of hydrogen gas available for your meter  
9 to pick up in the event that hydrogen gas was  
10 continually generated by this environment,  
11 within a reasonable degree of scientific  
12 probability?

13 A. I have to answer yes and no. And  
14 the reason that I say yes is if it is  
15 continually generated I probably would have  
16 detected it with my meter.

17 No, because when I talked to the  
18 captain on board he said that the area was  
19 continually flooding because of some leak and  
20 that water would have been displacing it had it  
21 been trapped under there.

22 So I have a different situation  
23 this time than a dry lazarette during the  
24 incident, at the time of the incident.

25 Q. Okay.

1 A. Because he said -- they showed me  
2 the high water mark which was several inches  
3 above the floor, the floorboards in the  
4 lazarette and so that would have displaced  
5 anything under there.

6 Q. In your -- I guess you said in your  
7 attendance at this seminar or your meeting that  
8 you went to after you had the opportunity to  
9 look at this vessel back in 1997 --

10 A. Right.

11 Q. You learned, I think you said that  
12 you learned that a combination of cement and  
13 aluminum would result in the production of  
14 hydrogen gas, correct?

15 A. Yes.

16 Q. Who did you learn that from?

17 A. I don't recall. I was sitting  
18 there with four or five people and I think two  
19 or three of them at the same time said, oh.

20 You know, it was something that for  
21 some reason hadn't occurred to me. You have to  
22 realize, some of these guys are chemists and I  
23 am a chemical engineer. So my training in  
24 chemical engineering isn't quite as much in some  
25 of the chemistry as theirs and so it was more

1 obvious to them than it was to me that this  
2 would be a problem.

3 I never thought of it at the time.

4 Q. So this basically isn't something  
5 that you have learned and had experience with  
6 over the years, it's something that someone at a  
7 meeting told you and you are applying to a  
8 condition that you had looked at sometime  
9 before?

10 A. Right. Right, I went back sometime  
11 later and looked in my textbooks and, oh, yes,  
12 it makes sense.

13 Q. Do you know whether or not aluminum  
14 in contact with cement generates hydrogen or  
15 whether there has to be some other catalyst  
16 present?

17 A. I think about the only thing that  
18 you need is moisture, water, dampness, humidity  
19 possibly.

20 Q. And I think you said that in 1997  
21 that that compartment was dry, correct?

22 A. As I recall I was told that it was  
23 dry. There were not any leaks in the  
24 compartment similar to like I said, the flooding  
25 that I am talking about. Prior to the accident,

1 obviously. After the accident the thing had  
2 been under water and I couldn't detect anything  
3 with my meter because it had been submerged.

4 Q. But before that, the history that  
5 you got from the captain and other people was  
6 that the compartment was dry?

7 A. It had been dry, yes.

8 Q. And on this occasion --

9 A. When I say dry, not full of water.

10 I mean, you've always got humidity around the  
11 ocean.

12 Q. On this particular occasion when  
13 you examined the vessel a month ago I think you  
14 said that the cement was damp or had been wet  
15 because of a leak in the area?

16 A. It was dry in the surface because,  
17 you know, we pulled the plates up and it was  
18 dry. But, I mean, you could see the high water  
19 mark where the captain, before they had pulled  
20 the boat out of the water and drained everything  
21 out and dried it out, he pointed out, yeah, it  
22 had been flooding up to here and that made me  
23 feel better from the standpoint that I knew if  
24 the water had been up that high, if there were  
25 any hydrogen in the areas that I couldn't reach

1 with my hose, it probably would have been  
2 displaced.  
3 And this isn't a mechanism that  
4 occurs so rapidly that in a day or two you would  
5 have an explosive, you know, concentration of  
6 hydrogen.  
7 Q. Is that your opinion, sir, that --  
8 A. That would be my opinion.  
9 Q. That hydrogen gas would not  
10 accumulate rapidly enough in that environment  
11 for you to have been able to detect it had it  
12 only been a day or two when the condition was  
13 present?  
14 A. Right.  
15 Q. All right.  
16 A. I can't give you any numbers on  
17 that or rate, but that would be just be a feel  
18 that I have for the mechanism. It is a slow  
19 one.  
20 Q. But in any event, when you tested  
21 it a month ago, even though it had been in the  
22 presence of water and it had been a confined  
23 area, when you put your hose in there you didn't  
24 find the presence of any hydrogen?  
25 A. Correct.

1 A. Sure.  
2 Q. Where was it that you got your  
3 engineering degree?  
4 A. University of Cincinnati.  
5 Q. And what year?  
6 A. 1970.  
7 Q. Have you been back to any type of  
8 formal continued education after that?  
9 A. Not in chemical engineering, no.  
10 Q. In what, if anything?  
11 A. Well, my whole training as a marine  
12 chemist. That is quite extensive.  
13 Q. What sort of additional training  
14 did you have?  
15 Do you have a curriculum vitae with  
16 you that you can share with us?  
17 A. I mailed one to the office. I am  
18 sorry, I didn't know that I had to bring one.  
19 MR. FAMULARI: It must have come  
20 here.  
21 BY MR. VALLE:  
22 Q. If you can mail one to me. You've  
23 got my card. If you can mail it to Larry Valle.  
24 A. Okay.  
25 Q. If you can mail a copy to me.

1 Q. And you wouldn't have conducted  
2 that test, would you, had you thought that it  
3 wouldn't have been possible at that time for  
4 there to be hydrogen there?  
5 A. No.  
6 Q. I mean, you were testing it for a  
7 reason?  
8 A. Yes.  
9 Q. Because you suspected there might  
10 be --  
11 A. I wanted to be sure since I had  
12 this knowledge from previous incidents that I  
13 cover all of my bases. I mean, my job is to  
14 test for anything that I suspect.  
15 Q. Sure. Did you ever write a letter  
16 to the manufacturer of the vessel or to anyone  
17 else describing the potential dangers of  
18 concrete in an environment where it makes  
19 contact with aluminum?  
20 A. No.  
21 Q. Let me ask you a few questions  
22 about -- you and I have not met before?  
23 A. No.  
24 Q. Let me ask you a couple of  
25 questions about your general background.

1 A. I faxed someone a copy.  
2 MR. FAMULARI: It wasn't me, so it  
3 must have been Manny.  
4 THE WITNESS: I know I faxed one to  
5 this office.  
6 BY MR. VALLE:  
7 Q. That is all right. What additional  
8 training did you go through?  
9 A. Well, to become a marine chemist  
10 you are required to have experience in the  
11 shipyard industry, in the welding industry, a  
12 minimum of three years work in the chemical  
13 industry.  
14 And I worked for Union Carbide and  
15 Clorox Company so I have a fair amount of  
16 experience in those industries.  
17 Q. Peace through chemistry?  
18 A. Yes. There is an 18 module --  
19 there is an 18 module training program  
20 discussing various topics that you can't get at  
21 a university level that relate to the marine  
22 chemist's specific job such as instrument  
23 training, explosion technology, things like how  
24 clean is clean when you go on board a tanker or  
25 any place where you are looking to make sure

1 that things are properly clean. Various topics  
2 like that.  
3 Q. And when you completed these  
4 courses did you receive any certificates of  
5 completion or any I guess credit hours, anything  
6 like that?  
7 A. Not credit hours because this is  
8 all part of the NFPA program. What I received  
9 was certification as a NFPA certified marine  
10 chemist when I got done.  
11 Q. When did you receive that?  
12 A. December of 1980, I think. Or was  
13 it December of '81. I can't remember now.  
14 December of '81, I think.  
15 Q. Around 1981?  
16 A. Yeah.  
17 Q. Have you ever held yourself out to  
18 be a ship designer?  
19 A. No.  
20 Q. Have you ever held yourself out to  
21 be a ship builder?  
22 A. I have been.  
23 Q. You built ships?  
24 A. Not ships, yachts.  
25 Q. Yachts?

1 A. Yes. I ran Broward Marine which  
2 built aluminum yachts and in California I had my  
3 own company building fiberglass sailboats.  
4 Q. When you were building yachts at  
5 Bradford -- Not, Bradford, at Broward, excuse  
6 me, what did you use for ballast?  
7 A. Lead.  
8 Q. Lead?  
9 A. Yes.  
10 Q. Do you know of anything, do you  
11 know of any reaction that occurs between lead  
12 and aluminum in the presence of water?  
13 A. Yes, sure, we didn't lay the lead  
14 on the aluminum. We put it on top of a coating  
15 that would keep them apart from each other.  
16 Q. Do you know whether or not in this  
17 particular case --  
18 A. Which case is that?  
19 Q. In this particular case involving  
20 the yacht that you looked at in 1997, do you  
21 know whether or not there was any coating on the  
22 aluminum that was underneath the deck of the  
23 lazarette when you looked at it then?  
24 A. I have no idea.  
25 Q. When you looked at it a month ago

1 do you know whether or not the aluminum was  
2 coated at that time?  
3 A. It didn't appear to be coated.  
4 Q. You could only see it above of the  
5 level on concrete, though, correct?  
6 A. I could only see it to the edge.  
7 And if someone would have painted it to pour the  
8 concrete in there I probably would have seen  
9 some overspray, something come through limber  
10 holes or whatever around the edge. I would have  
11 expected to see that.  
12 Q. How about polyethylene,  
13 polyurethane, that type of coating, would you  
14 have expected to see that?  
15 A. I wouldn't have expected to see it.  
16 But, had it been put in there I might have seen  
17 some traces of it.  
18 Q. Okay, or you might not, right? I  
19 mean, you weren't looking for it, were you?  
20 A. Not specifically. But as a marine  
21 surveyor you learn to notice anything that is  
22 out of the ordinary and --  
23 Q. Would you consider that out of the  
24 ordinary?  
25 A. Yes.

1 Q. Okay.  
2 A. To have polyurethane underneath  
3 cement, yes, that would be out of the ordinary.  
4 Q. Do you have any training in or have  
5 you ever held yourself out to be a marine  
6 architect, naval architect?  
7 A. No.  
8 Q. Have you ever held yourself out to  
9 be an expert in the investigation and analysis  
10 of cause and effect in explosion cases?  
11 A. I have testified as an expert  
12 witness in other fire cases, not other explosion  
13 cases.  
14 Q. Okay. Well, the question was  
15 specifically in explosion cases?  
16 A. No.  
17 Q. This was your first investigation  
18 into an explosion?  
19 A. That is correct. We try not to  
20 have explosions in my industry.  
21 Q. Now, you work regularly for  
22 Bradford Marine in your capacity as a marine  
23 chemist?  
24 A. Yes.  
25 Q. Who else do you regularly work for

- was area coated w/ polyethylene before cement added.

1 in your capacity as a marine chemist?  
 2 A. Almost everybody in the marine  
 3 industry in South Florida. I am the only one  
 4 down here.

5 Q. Okay.

6 A. And I work for many of the  
 7 shoreside companies, typically Cliff Berry and  
 8 people who are cleaning the shoreside tanks in  
 9 Port Everglades.

10 You see those big two hundred feet  
 11 diameter, 60 foot high gasoline tanks, before  
 12 they are done with them I certify them before  
 13 anybody does any work as well, so anything of  
 14 that type.

15 Q. When you went on board the, let's  
 16 call it the subject yacht. What can we call it,  
 17 the --

18 MR. WEBER: SOUVENIR.

19 BY MR. VALLE:

20 Q. Okay, let's call it the SOUVENIR.  
 21 When you went on board the SOUVENIR in 1997 what  
 22 specific area and I am talking about before the  
 23 explosion occurred, when they brought the yacht  
 24 in -- strike that.

25 Let's go back to the beginning of

1 the repair work that was being done on the  
 2 SOUVENIR in 1997. At what particular point were  
 3 you called by Torch or anybody else at Bradford  
 4 to come down and look at the SOUVENIR?

5 A. They called me because they needed  
 6 to do some work in and around the engine room or  
 7 fuel tanks.

8 Q. Okay.

9 A. I wrote a certificate based on the  
 10 inspection that I made and unfortunately I can't  
 11 find the darn thing.

12 Q. When you say --

13 A. I got it out at some point later to  
 14 see what I had looked at and I know it was  
 15 nothing in this area and I don't know what  
 16 happened to it. It was not refiled where it  
 17 should have been filed. I can't find it.

18 Q. When you say this area you mean the  
 19 lazarette area?

20 A. Yes, the lazarette area.

21 Q. You say Bradford should have about  
 22 four or five copies of it?

23 A. Correct. Well, five copies are  
 24 written and one would have gone with the billing  
 25 that I gave to Bradford and three copies would

1 have been left with Torch and I would have kept  
 2 a cop for myself.

3 That long ago I don't know what  
 4 they did with theirs. I keep a copy of every  
 5 certificate that I have.

6 Q. I just asked you --

7 A. Like I say, I can't find mine  
 8 because it got pulled out at the time of this  
 9 incident and never got refiled.

10 Q. The question was, you did leave  
 11 several copies with Bradford?

12 A. Yes.

13 Q. Was there ever a time that you  
 14 posted a notice on the SOUVENIR certifying that  
 15 the entire ship was gas free?

16 A. No, no, and I wouldn't have. I  
 17 don't post them.

18 Q. Gas free means gas free today,  
 19 right?

20 A. I understand what you're saying.

21 MR. KALLEN: Wait -- go ahead.

22 BY MR. VALLE:

23 Q. My next question --

24 MR. KALLEN: What about an answer  
 25 to that?

1 BY MR. VALLE:

2 Q. You understand what I am saying,  
 3 what do you mean?

4 A. Well, my chemist certificate  
 5 stipulates the condition at the time that I make  
 6 the inspection.

7 It doesn't guarantee anything in  
 8 the future.

9 Q. That is what I am saying.

10 A. Yes.

11 Q. In a changing environment --

12 A. Exactly.

13 Q. In a work environment in a shipyard  
 14 you are aware that from time to time there is a  
 15 number of volatile liquids used in either  
 16 removing paint, cleaning metals, thinning paint,  
 17 that sort of thing, right?

18 A. Yes.

19 Q. And as the environment changes in  
 20 an area that you have inspected you would expect  
 21 that the people that, that would either call you  
 22 back or that they would take down the gas free  
 23 environment, correct?

24 A. Yes.

25 Q. When you went back to Bradford how



1 long had it been when you went -- strike that.  
 2 How long prior to the explosion had  
 3 it been that you had certified the areas that  
 4 you examined to be gas free?  
 5 A. I don't recall offhand, but I  
 6 believe it was like two or three months and the  
 7 vessel had been out of the water at that time.  
 8 It wasn't in the water.  
 9 Q. So they put it back in the water?  
 10 A. Yes.  
 11 Q. And they had been working on her  
 12 for two or three months between the time that  
 13 you certified her gas free and the time of the  
 14 explosion?  
 15 A. That is correct.  
 16 Q. Do you know what type of work they  
 17 did on that vessel during those two months?  
 18 A. I have no idea.  
 19 Q. Being in and around the vessel  
 20 after the explosion did you have occasion to see  
 21 any type of volatile liquid or solutions being  
 22 used in and around that vessel at that time?  
 23 Like, for example, acetone?  
 24 A. I didn't see anything anywhere in  
 25 the vicinity. There may have been on the dock

1 or somewhere else, but not anywhere near where  
 2 the incident occurred on the vessel. There was  
 3 nothing like that.  
 4 Q. Okay. I think you mentioned that  
 5 someone had told you that a gas, that a can of  
 6 acetone had tipped over in the lazarette?  
 7 A. Yes.  
 8 MR. FAMULARI: Object to the form.  
 9 BY MR. VALLE:  
 10 Q. And that a certain amount of  
 11 acetone had leaked out of that can?  
 12 A. No. They didn't tell me anything  
 13 leaked out of it. They just told me that there  
 14 had been one in there and they seen it tip  
 15 over.  
 16 We don't know whether it was full,  
 17 empty or whether something had poured out of it  
 18 or not, and --  
 19 Q. Do you know how long it had been  
 20 between the time that the can tipped over and  
 21 the time that Mr. Naranjo attempted to weld on  
 22 that deck?  
 23 A. No, I don't.  
 24 Q. Do you know the size of the can of  
 25 acetone that tipped over?

1 A. I got the impression it was a  
 2 quart.  
 3 MR. FAMULARI: Object to the form.  
 4 BY MR. VALLE:  
 5 Q. You got the impression it was a  
 6 quart?  
 7 A. From the discussion that as I  
 8 recall it was a quart can which was fairly long  
 9 and narrow and about maybe seven or eight inches  
 10 tall.  
 11 Q. Okay.  
 12 A. And it was -- I believe it was some  
 13 time before the boat maybe even came in the  
 14 yard. I don't think it was something that  
 15 happened within a day or two of when this  
 16 occurrence occurred, as I recall the  
 17 discussion.  
 18 But I can't tell you any more than  
 19 that because I don't remember. I don't remember  
 20 for sure.  
 21 Q. Okay. Would you agree, would you  
 22 agree with me that had acetone been in that can  
 23 and had the acetone spilled out, that the  
 24 volatile gases produced by the evaporation of  
 25 that acetone would have consumed an area far

1 greater than a quart?  
 2 A. The quart was a liquid.  
 3 Q. Right.  
 4 A. So had it evaporated it could have  
 5 enveloped the whole lazarette.  
 6 Q. Okay.  
 7 A. But it also would have been able to  
 8 be smelled by whoever went into it because it  
 9 does have an odor.  
 10 Q. Now, if this had happened sometime  
 11 before the explosion and the acetone found its  
 12 way down to the space beneath the floor of the  
 13 lazarette and it had been confined in that area,  
 14 I guess the gases generated by the --  
 15 A. Evaporating liquid.  
 16 Q. -- Evaporating acetone, would you  
 17 still have expected to smell it?  
 18 MR. FAMULARI: Object to the form.  
 19 BY MR. VALLE:  
 20 Q. Or would it be --  
 21 A. Possibly not. I won't say probably  
 22 not, but I would say possibly not.  
 23 Q. Okay. I think you also mentioned  
 24 that part of the information that you had been  
 25 provided was that gasoline had been stored in

1 the lazarette by the owner prior to this  
 2 particular incident, correct?  
 3 A. I think they -- someone  
 4 mentioned --  
 5 MR. KALLEN: Let me object to the  
 6 form, go ahead.  
 7 THE WITNESS: I think someone had  
 8 mentioned that they had had one of those red  
 9 six gallon cans, metal cans typical of what  
 10 you use with an outboard motor in a smaller  
 11 boat.  
 12 It was discussed. I don't know, I  
 13 don't recall whether it was stored in there  
 14 for any length of time or had just been put  
 15 in there. I think I am more -- I don't  
 16 recall what I wrote in here, whether I  
 17 mentioned that or not.  
 18 BY MR. VALLIE:  
 19 Q. I don't think that you did. That  
 20 is why I am asking.  
 21 A. It just sticks in my head that it  
 22 was discussed and it may just be my memory that  
 23 we talked about it, not that they actually said  
 24 it was in there.  
 25 Q. Was anything else to your knowledge

1 possible causes?  
 2 A. My letter was a list of possible  
 3 causes. I think based on discussions after the  
 4 fact like we were talking about, about the  
 5 hydrogen, that is the most probable.  
 6 Q. Most possible or most probable?  
 7 A. Most probable.  
 8 Q. Are you saying here today there is  
 9 better than a fifty-fifty chance that it was the  
 10 hydrogen or are you saying --  
 11 A. Yes.  
 12 Q. Okay.  
 13 A. Yes.  
 14 Q. Did you ever examine the area of  
 15 the hull either in 1997 or a month ago where  
 16 cement comes in direct contact with aluminum?  
 17 A. I know I have looked at it. I  
 18 don't know -- what do you mean by examined?  
 19 Q. Examined? I mean, you know, look  
 20 at it, take samples, test it?  
 21 A. No, I didn't take samples or test  
 22 it, no.  
 23 Q. What did it look like to you, and I  
 24 am talking about -- Let me rephrase the question  
 25 so we get specific.

1 stored in that area, in the lazarette?  
 2 A. Well, at the time that I did my  
 3 investigation there was nothing in there.  
 4 Q. No, no, I mean by history.  
 5 Obviously, when you did your investigation --  
 6 A. Oh, okay.  
 7 Q. -- There was nothing there, but  
 8 what did you learn?  
 9 A. No other, no other flammable  
 10 liquids other than the two, acetone and gasoline  
 11 were discussed that I recall.  
 12 Q. All right.  
 13 A. And it may have been me who brought  
 14 up the gasoline. I said, well, you know,  
 15 because typically they are down there. And that  
 16 is why it might be sticking in my memory,  
 17 because I was looking for a cause and if I  
 18 didn't put it in my letter, it may not have --  
 19 they may have said, no, there wasn't and that is  
 20 why I am, I -- It has been a long time, you got  
 21 to realize.  
 22 Q. I understand. Are you rendering an  
 23 opinion here today within a reasonable degree of  
 24 scientific certainty as to the cause of this  
 25 explosion or were you giving us a list of

1 The question is, did you ever look  
 2 at or examine the area beneath the floor of the  
 3 lazarette either in 1997 or a month ago where  
 4 the cement beneath the lazarette came in contact  
 5 with the aluminum portions of the vessel,  
 6 whether it be the hull or the frame?  
 7 A. Well, in 1997 the possibility of  
 8 hydrogen generation hadn't occurred to me, so I  
 9 know I looked at the area, but I wasn't looking  
 10 with that in mind.  
 11 Just recently when I was on board I  
 12 did look a little more closely because of that.  
 13 The cement is confined by the framework in there  
 14 that is the structural members of the vessel and  
 15 there is not a whole lot to see other than where  
 16 the top of the cement touches the aluminum.  
 17 Q. Okay.  
 18 A. There is nothing else to see.  
 19 Q. Describe for me, if you would,  
 20 please, what the top of the cement looked like?  
 21 A. Cement in contact with aluminum, a  
 22 little bit of dirt, a little bit of -- kind of a  
 23 white substance that is typical of scum that you  
 24 get in bilges, you know, that is about it. And  
 25 nothing outstanding in my mind that I would say,

owner stored gas cans in lazarette

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25 A. If it doesn't mention gasoline in

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24 Q. Okay. Did you either as part of  
25 your duty or part of your procedure as an

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1 investigator or as a marine surveyor direct  
 2 Bradford Marine to save and preserve any of the  
 3 evidence of the explosion?  
 4 A. No.  
 5 Q. Such as the lazarette deck plates  
 6 that were bent up or any of the other evidence  
 7 of the explosion at the time?  
 8 A. No, no, I didn't.  
 9 Q. Do you know whether or not they  
 10 did?  
 11 A. I have no idea.  
 12 Q. In explosion cases would you expect  
 13 that through scientific evidence residue of an  
 14 explosion on the bottom surface of the deck  
 15 plate would have revealed the nature of the  
 16 substance which had been ignited?  
 17 A. If it was something that would  
 18 leave a residue, yes. I don't know whether a  
 19 hydrogen explosion would because hydrogen  
 20 combines with oxygen and you create water. What  
 21 is the residue when you are in a boat that gets  
 22 flooded?  
 23 Q. Okay, my question is --  
 24 A. Yes. Had it been some other  
 25 substance --

1 Q. Sure.  
 2 A. And I don't recall seeing anything.  
 3 Q. But you as a chemist know that  
 4 there are things that you can't visually see  
 5 that you can pick up with certain equipment?  
 6 A. Yes, of course.  
 7 Q. And if those plates were available  
 8 at the present time we could test them and  
 9 determine if some substance had been involved in  
 10 this particular explosion which left a residue  
 11 and a telltail fingerprint as to what the  
 12 substance was, right?  
 13 A. Yes, sure. I don't know who else  
 14 they hired at the time as surveyors and so on.  
 15 There were a lot of people around and the  
 16 question to me was what caused the explosion,  
 17 and I wasn't hired by anybody to represent them  
 18 as a surveyor.  
 19 Had I done that, I probably would  
 20 have done a lot more than just write this  
 21 letter.  
 22 Q. Okay. One of the things that you  
 23 would have done probably is tell them to  
 24 preserve the evidence, right?  
 25 A. Possibly, yes, sure.

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1 Q. Right.  
 2 A. I mean, you are familiar with  
 3 gunpowder residue and things like that  
 4 obviously. I don't know --  
 5 Q. Or gasoline or oil?  
 6 MR. KALLEN: Or methane.  
 7 BY MR. VALLE:  
 8 Q. Or methane or acetone?  
 9 A. I understand what your question is  
 10 and I can't -- I can't testify that yes these do  
 11 create residues and, yes, they would be found  
 12 because I don't know.  
 13 Q. There is a possibility that if some  
 14 of those substances would cause a residue as a  
 15 secondary result of an explosion, that residue  
 16 would have been available on the bottom of those  
 17 plates to be tested, correct?  
 18 MR. FAMULARI: Object to the form.  
 19 THE WITNESS: Possibly, yes  
 20 BY MR. VALLE:  
 21 Q. And --  
 22 A. I don't recall seeing anything out  
 23 of the ordinary. Like I say, had I noticed  
 24 something I probably would have said what is  
 25 that.

1 Q. I represent the manufacturer of the  
 2 boat?  
 3 A. Right.  
 4 Q. We are trying find out whether it  
 5 was a manufacturing defect, if any, which caused  
 6 the explosion or if it was other things or other  
 7 substances.  
 8 A. I understand that, yes.  
 9 Q. It's not possible for me to do that  
 10 at this point without those plates, is it?  
 11 MR. FAMULARI: Object to the form.  
 12 THE WITNESS: I don't know,  
 13 probably not.  
 14 BY MR. VALLE:  
 15 Q. Okay. Now, in your original report  
 16 I think you gave three possible causes for the  
 17 explosion to have occurred?  
 18 A. Those are my thoughts at the time,  
 19 yes.  
 20 Q. And I take it those are your  
 21 thoughts within a reasonable degree of  
 22 scientific certainty because you wrote the  
 23 report as a marine chemist and you are giving  
 24 the report to a client who is paying you for  
 25 information as to what caused the explosion?

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1 A. Correct.  
 2 Q. Okay. One of the three sources I  
 3 think you referred to and I am looking at page  
 4 two of your report, you mention the can of  
 5 acetone lying on the deck above the lazarette?  
 6 A. Yes.  
 7 Q. You didn't say it was in the  
 8 lazarette, you said it was on the deck above the  
 9 lazarette, so then can I assume that your memory  
 10 was better when you wrote this report than it is  
 11 today?  
 12 A. Of course.  
 13 Q. So then the history that was given  
 14 to you was apparently that a can of acetone had  
 15 been laying on its side above the lazarette on  
 16 the wooden deck, correct?  
 17 A. Which paragraph are you referring  
 18 to?  
 19 Q. Paragraph two on page two?  
 20 A. Okay. Yes, of course.  
 21 Q. And you would assume I guess then  
 22 that the acetone went through the wood plank  
 23 deck down into the area of the lazarette?  
 24 MR. FAMULARI: Object to the form.  
 25 THE WITNESS: Possibly, yes.

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1 BY MR. VALLE:  
 2 Q. Okay. And on a ship liquids can  
 3 find their way into a bilge and that is  
 4 basically the reason that the bilge is there,  
 5 isn't it?  
 6 A. Well, not to accumulate flammable  
 7 liquids, but, yes, to accumulate liquids,  
 8 correct.  
 9 Q. And if they happen to be flammable  
 10 they are going to find their way into the bilge?  
 11 A. That is correct.  
 12 Q. And this area that was below the  
 13 lazarette is part of the bilge system?  
 14 A. I think it had a bilge pump in the  
 15 forward end of it, so I guess you would say  
 16 that, yes.  
 17 Q. I think the second -- I am sorry,  
 18 you did mention gasoline. I am sorry, forgive  
 19 me. Let me read this to you, that paragraph.  
 20 "Likewise, at some time gasoline in storage  
 21 containers," plural, "may have been stored in  
 22 the lazarette."  
 23 So I take it that you received that  
 24 as a history from somebody?  
 25 A. Okay.

1 Q. So there are multiple gasoline  
 2 containers and they were stored in the  
 3 lazarette?  
 4 MR. KALLEN: Object to the form.  
 5 BY MR. VALLE:  
 6 Q. According to your history?  
 7 MR. KALLEN: May have.  
 8 MR. VALLE: May have.  
 9 MR. KALLEN: At some time.  
 10 BY MR. VALLE:  
 11 Q. At some time, correct?  
 12 A. Yes.  
 13 Q. And I take it that was possible  
 14 cause number two, gasoline had gotten down  
 15 somehow into the area beneath the deck of the  
 16 lazarette?  
 17 A. Yes.  
 18 Q. Into that gap?  
 19 A. Yes.  
 20 Q. The third source I think you  
 21 mentioned were live bait wells. Can you tell me  
 22 where those live bait wells were with respect to  
 23 the lazarette?  
 24 A. As I recall they were in the floor  
 25 of the fish deck and extended down into the

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1 lazarette. I don't recall exactly, but as I  
 2 recall that is my recollection.  
 3 Q. Okay, and what were they made of?  
 4 A. I think aluminum. But I don't  
 5 recall.  
 6 Q. And were they on either side of the  
 7 lazarette? In other words, port and starboard  
 8 on the ship, if you can recall?  
 9 A. I don't recall. I don't recall  
 10 that configuration at the time.  
 11 Q. Do you know whether or not the area  
 12 of the ship that you were in in 1997, the  
 13 lazarette area, was an area of the ship that  
 14 existed by virtue of standard design or whether  
 15 or not that area was part of a customization of  
 16 the vessel which was specified at the time that  
 17 it was under construction?  
 18 A. I have no idea.  
 19 Q. Whenever anybody welds on a ship in  
 20 the area and the other side of the plate that  
 21 they are welding on is part of the bilge system  
 22 of the ship, do you think that it would be  
 23 reasonably prudent to have had someone test the  
 24 environment on the far side of the plate --  
 25 MR. FAMULARI: Object to the form.

*Bilge underneath  
the plate*



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1 BY MR. VALLE:  
2 Q. -- Prior to commencing welding  
3 operation?  
4 MR. FAMULARI: Object to the form.  
5 THE WITNESS: Yes.  
6 BY MR. VALLE:  
7 Q. Bilges customarily present a danger  
8 of accumulation of volatile and flammable gases,  
9 correct?  
10 A. In and around machinery areas,  
11 yes. In a lazarette not necessarily because  
12 they don't normally have flammable liquids  
13 stored in there.  
14 Usually there are areas on a vessel  
15 where flammable liquids are stored and so  
16 designated.  
17 Q. Assuming that over a period of a  
18 year or months or whatever of use of a vessel in  
19 the normal course, wouldn't you expect that  
20 flammable liquids or gases whether they be  
21 methane or anything else have a potential for  
22 accumulating in the bilge system of a vessel  
23 which is why you always require the bilges to be  
24 examined before welding is done or hot work is  
25 done on the far side of them?

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1 A. Well, I don't completely agree with  
2 your statement, but, yes, that is the reason  
3 that you look in the lower areas of the vessel  
4 because anything heavier than air will  
5 accumulate there or liquids are going to run  
6 there.  
7 Q. Okay. And if gases are volatile  
8 gases those gases would rise off the liquid in  
9 the bilge, correct?  
10 MR. KALLEN: Object to the form.  
11 THE WITNESS: Not always.  
12 BY MR. VALLE:  
13 Q. All right.  
14 A. If they are heavier than air they  
15 will stay there. That is why we have blowers  
16 for gasoline boats, so they don't blow them up  
17 everytime that they start the engine.  
18 Q. And they still blow them up?  
19 A. Yes.  
20 Q. Even after they vent the hell out  
21 of the bilges they blow them up?  
22 A. Yes, that is right.  
23 Q. Because you can never tell?  
24 A. That is exactly right.  
25 (Discussion off the record.)

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1 BY MR. VALLE:  
2 Q. Let's go back to your report for a  
3 second. The third possible source that you  
4 mentioned in your written report to your client,  
5 Bradford Marine, was the possible accumulation  
6 of methane gas as a result of the degradation of  
7 sea life and other things in sea water?  
8 A. Correct.  
9 Q. Is methane gas something that you  
10 can smell?  
11 A. No.  
12 Q. So someone down inside the  
13 lazarette such as Mr. Naranjo would, if there  
14 was a ton of methane gas he would never have  
15 smelled it, right?  
16 A. Well, if there was a ton of it down  
17 there he would have been asphyxiated, but had  
18 there been enough underneath there to cause an  
19 explosion, no, he would not have smelled it. It  
20 is odorless.  
21 Q. Let me rephrase the question. Mr. ✓  
22 Rimmel, do you have an opinion within a  
23 reasonable degree of scientific certainty as to  
24 whether or not Mr. Naranjo would have smelled  
25 methane gas on the date this accident occurred

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1 had the methane gas accumulated underneath the  
2 deck plate of the lazarette?  
3 A. Yes.  
4 Q. And what is that opinion?  
5 A. He probably would -- he would not  
6 have smelled the gas because it is odorless.  
7 Q. When you are giving your courses to  
8 welders, when you are talking to, you know, the  
9 people at Bradford Marine and your other good  
10 customers, your regular people and you are  
11 giving safety courses, do you ever tell the  
12 welders whenever you are in doubt about whether  
13 or not there is a hollow space underneath the  
14 plates that you are going to weld on, tap them  
15 or do anything else to determine whether or not  
16 there is a hollow space there?  
17 A. No, we don't say anything like  
18 that. People usually know whether something is  
19 hollow or not and if they're welding on it, even  
20 the OSHA regulations talk about what to do with  
21 hollow structures and/or confined spaces.  
22 Q. Sure.  
23 A. Hollow structures would be  
24 different than this because we are talking about  
25 pipes or handrails which are hollow structures,

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1 thing like that.  
 2 Q. Well, when you don't know, when you  
 3 have no information to a certainty as to whether  
 4 or not there is a hollow area beneath where you  
 5 are welding, I mean, isn't that the time that  
 6 you should either ask a competent person to  
 7 check the area or make some sort of  
 8 determination as to whether or not it is hollow  
 9 underneath where you are welding?  
 10 A. Definitely, that is common sense  
 11 and we always teach people -- common sense is a  
 12 pretty logical way to go at figuring out whether  
 13 something is safe.  
 14 Q. I think you have already said that  
 15 it would not have been reasonable simply to rely  
 16 on the word of the captain because you don't  
 17 know what the captain knows?  
 18 A. Exactly.  
 19 Q. So Mr. Naranjo in this case because  
 20 he had some concern, I mean, he asked the  
 21 captain, he had some concern about what was  
 22 underneath the deck plates, should have gone to  
 23 a competent person in the shipyard and asked  
 24 them to make a determination?  
 25 A. I don't know if he had that concern

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1 or not. I don't know why he asked the captain.  
 2 Q. Well, assuming he was concerned  
 3 that there might be something in the area or  
 4 something underneath the deck that might be  
 5 hazardous if he welded there, shouldn't he have  
 6 gone to a competent person and asked for a  
 7 determination?  
 8 A. I wouldn't conclude that is why he  
 9 asked the captain the question that he did.  
 10 Q. No, I am saying assume that he  
 11 wanted to know --  
 12 A. I am sorry.  
 13 Q. -- What was underneath the area  
 14 where he was welding, and assume that is why he  
 15 asked the captain because he didn't know what  
 16 was under that area?  
 17 A. Making that assumption, yes, it  
 18 would have been best if he asked his boss or a  
 19 competent person to check the area.  
 20 MR. KALLEN: And by competent  
 21 person we are talking about shipyard  
 22 competent person?  
 23 THE WITNESS: Shipyard competent  
 24 person as defined by OSHA regulations.  
 25 BY MR. VALLE:

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1 Q. Have you ever investigated an  
 2 incident where either a fire or explosion  
 3 occurred as a result of the ignition of methane  
 4 gas?  
 5 A. No.  
 6 Q. When you spoke to the people at  
 7 Bradford Marine prior to your examination of the  
 8 vessel in 1997, did they tell you whether or not  
 9 the area beneath the deck plates was airtight  
 10 and watertight before they began their  
 11 operations to repair the vessel?  
 12 A. I don't recall.  
 13 Q. Would it have been significant to  
 14 you to learn that the area in the opinion of the  
 15 people at Bradford was both airtight and  
 16 watertight below the deck plates of the  
 17 lazarette prior to the time that Mr. Naranjo  
 18 began his welding?  
 19 A. Yes.  
 20 Q. How would that have been  
 21 significant to you?  
 22 A. Because that would have prevented  
 23 any ventilation or dilution of whatever  
 24 atmosphere was under there and no matter what  
 25 got in there it would have contained it and kept

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1 it concentrated and more dangerous.  
 2 Q. Methane gas is the kind of gas that  
 3 poses a danger to coal miners, correct?  
 4 A. Yes.  
 5 Q. That is why they bring canaries  
 6 down to coal mines because the birds are so  
 7 sensitive to the gas and --  
 8 A. Not anymore. They used to. They  
 9 use meters like I do now. But that is what they  
 10 did originally.  
 11 (Discussion off the record.)  
 12 THE WITNESS: That was before they  
 13 invented the flame safety lamp and the flame  
 14 safety lamp had a light in it, a lit candle  
 15 or a lit flame of some sort and a screen  
 16 over it so the gas couldn't get in and  
 17 explode, but if that flame went out at that  
 18 point they knew it was dangerous. And they  
 19 got out of there real quick.  
 20 BY MR. VALLE:  
 21 Q. When you examined the area beneath  
 22 the lazarette in 1997, by the time that you had  
 23 gotten there was that area dry or was it still  
 24 wet?  
 25 A. I don't remember.

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1 Q. You mentioned, you used a  
 2 descriptive word in your report concerning the  
 3 lazarette itself and I think you called it a  
 4 tank. Do you recall that?  
 5 A. Where?  
 6 Q. Let me --  
 7 A. On page two?  
 8 Q. Yes, I am trying to find out where  
 9 you did that.  
 10 MR. KALLEN: Oh, top of the page,  
 11 third line, maybe that was it.  
 12 BY MR. VALLE:  
 13 Q. Yes, okay, right. Then I am  
 14 reading from your report, "I inspected the  
 15 interior of the vessel, forward of the original  
 16 transom."  
 17 When you said forward of the  
 18 original transom what did you mean?  
 19 A. Well, there are two transoms on  
 20 this boat. This boat as I recall was built and  
 21 then an addition was put on it before it was  
 22 ever delivered.  
 23 Q. Okay, I had asked you about that  
 24 earlier?  
 25 A. Yes.

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1 Q. So then we can I guess --  
 2 A. I never saw the plans, but as I  
 3 recall when I went down inside somewhere or was  
 4 talking and you could see the original transom  
 5 of the boat. They never took it out and put a  
 6 straight bulkhead there.  
 7 I think they still had a curved  
 8 transom on there and then they added this other  
 9 section on.  
 10 Q. Okay, so --  
 11 A. If I remember correctly.  
 12 Q. So the lazarette section that you  
 13 were in was aft of the original?  
 14 A. Of the original transom of the  
 15 boat, yes.  
 16 Q. Then you mentioned here, and let me  
 17 read the whole sentence. "I inspected the  
 18 interior of the vessel forward of the original  
 19 transom and have determined that there are no  
 20 fuel tanks adjacent to the tank in question."  
 21 So top three lines of page --  
 22 A. Right, I want to see what I wrote  
 23 right before that to see if I was discussing a  
 24 tank. No, it doesn't relate. That may have  
 25 been a misnomer there saying tank. I may

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1 have --  
 2 Q. You may have meant compartment?  
 3 A. Yes, I may have meant compartment  
 4 or space.  
 5 Q. I wondered if it was a term of art  
 6 where you call something like that a tank?  
 7 A. No, probably as I was composing  
 8 this it just slipped out, you know.  
 9 Q. Okay.  
 10 A. I should have said space in  
 11 question.  
 12 Q. Did you ever check the live bait  
 13 wells on that vessel for leakage?  
 14 A. No.  
 15 Q. Are the live bait wells still on  
 16 the vessel as of the time that you saw it a  
 17 month ago?  
 18 A. I don't recall.  
 19 Q. Do you know which crew members  
 20 actually drilled holes in the aluminum deck of  
 21 the lazarette prior to the time that Mr. Naranjo  
 22 began his welding operation?  
 23 A. I don't know who drilled the hole.  
 24 I know that there was one hole that I was told  
 25 was drilled because they were going to bolt

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1 these down and I think when they drilled the  
 2 first hole and found that it was as thin as it  
 3 was, they determined it wasn't heavy enough to  
 4 hold these pumps and that is when they decided  
 5 to weld something down.  
 6 I don't know if there was more than  
 7 one hole drilled or not or who drilled them.  
 8 Q. What size hole was that, do you  
 9 recall?  
 10 A. Quarter inch, three eighths,  
 11 something like that. That is all that I recall.  
 12 Q. Would it have been large enough for  
 13 you to be able to snake your hose from your  
 14 multi gas tester into that hole to --  
 15 A. Yes.  
 16 Q. -- Had you been called to do so?  
 17 A. Yes.  
 18 Q. To your knowledge had there ever  
 19 been any prior explosions at Bradford Marine  
 20 under similar circumstances?  
 21 A. No.  
 22 Q. Was this the first occasion, and  
 23 when I say this, I mean your report which was  
 24 marked as Exhibit 17 in this case, was this  
 25 report -- strike that. Let me start over.

two Transoms

one hole drilled

1 Was the report marked as Exhibit 17  
2 in this case the first opportunity that you had  
3 to mention a multi gas tester to Bradford  
4 Marine?  
5 A. No.  
6 Q. How long had you worked for them  
7 prior to this particular explosion in 1997?  
8 A. Well, ever since I became a marine  
9 chemist in 1981 or December of '80.  
10 Q. If you had to give it to me off the  
11 top of your head how many times would you have  
12 mentioned to management or to the certified  
13 competent persons, shipyard competent persons at  
14 Bradford Marine that they should have a multi  
15 gas tester or some kind of sniffer on hand when  
16 they are doing these operations?  
17 A. I can't give you an absolute  
18 number. I know that each of the competent  
19 persons who was trained had this mentioned a  
20 number of times throughout the course that they  
21 can't do their job without having a way to run  
22 the test.  
23 MR. VALLE: Excuse me a second.  
24 (Discussion off the record.)  
25 THE WITNESS: In addition to

1 training, and I noticed I mentioned in here  
2 four people, those four people at various  
3 times throughout the years, I know that I  
4 probably at least once or twice to each of  
5 them would have mentioned if they were  
6 working for Bradford at that time and I am  
7 not sure if all of them were because I don't  
8 remember who they are.  
9 I would have mentioned, you know,  
10 you need to get a meter for this or you have  
11 to have a meter in this yard to use.  
12 BY MR. VALLE:  
13 Q. Would it be --  
14 A. So it would have been mentioned a  
15 few times, anyway.  
16 Q. Over the course of the years?  
17 A. Yes, over the course of the years.  
18 Q. To people who would have been in  
19 management or shipyard competent persons working  
20 at Bradford?  
21 A. The competent persons were either  
22 the welding foreman or someone of that status.  
23 It wasn't the welders themselves. It was either  
24 a welding foreman or Torch. I think his job was  
25 safety something or other.

1 Q. Okay.  
2 A. So these were people who were not  
3 on a line with welders, these were upper --  
4 Q. Management?  
5 A. Yes, management of some sort, yes.  
6 Q. So you did mention to management  
7 on --  
8 A. Yes.  
9 Q. -- On a number of occasions prior  
10 to this explosion that one of the pieces of  
11 equipment that they needed to have on hand was a  
12 multi gas tester?  
13 A. Yes.  
14 Q. And they call these things  
15 sniffers, is that a nickname?  
16 A. That is a nickname for it, yes.  
17 Q. In your report you mention that the  
18 crew, and I will read this again, it is on page  
19 three, "The crew who initially started to  
20 install the pumps stated that they had drilled a  
21 couple of holes," not one, but "a couple of  
22 holes in the area."  
23 A. Well, like I said, I don't remember  
24 how many.  
25 Q. Okay, so that there were at least a

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1 shipyard industry?  
 2 A. 1915.54?  
 3 Q. Yes, 1915.54.  
 4 A. How about --  
 5 Q. 1915.54 C, before welding, cutting  
 6 or bracing is begun on structural voids such as  
 7 skegs, bilges, keels, et cetera, et cetera, a  
 8 competent person shall inspect the object and if  
 9 necessary test it for the presence of flammable  
 10 liquids or vapors.  
 11 A. Well, that is one area that covers  
 12 it. Another one is 1915.14 part B, where it  
 13 says hot work requiring testing by competent  
 14 person, that is different in there than here.  
 15 It is probably twelve in here and  
 16 it says, shall be tested, dry cargo holds,  
 17 bilges, et cetera.  
 18 Q. Okay, well, then --  
 19 A. Your book is -- it has been  
 20 renumbered.  
 21 Q. Okay, let me make it simple then.  
 22 Based on OSHA the regulations that existed at  
 23 the time that this explosion occurred, if there  
 24 was going to be welding on the deck of the  
 25 lazarette and there was any suspicion whatsoever

1 now?  
 2 A. I believe they do now, yes.  
 3 Q. Do you know whether or not it was  
 4 purchased as a result of this particular  
 5 incident?  
 6 A. I have no idea.  
 7 Q. When you have a changing  
 8 environment on board ship such as a vessel under  
 9 major repairs or renovations, do you have an  
 10 opinion, sir, as to whether or not it would be a  
 11 prudent practice to use a multi gas tester on a  
 12 daily basis to determine if there had been a  
 13 change in environment in areas which are about  
 14 to undergo hot work?  
 15 A. That is required.  
 16 Q. Okay. And that was not done in  
 17 this case, was it?  
 18 A. No.  
 19 Q. From your testimony I have assumed  
 20 certain things and I have learned not to assume  
 21 much of anything when we are dealing with  
 22 experts, so let me ask you very directly.  
 23 At the time that you examined the  
 24 area of the explosion in 1997 did you conduct  
 25 any tests at all?

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1 that there was a void space beneath it, the  
 2 shipyard competent person should have tested  
 3 that space for flammable fluids or vapors prior  
 4 the commencement of welding operations, correct?  
 5 A. Yes.  
 6 Q. And that is required by law?  
 7 A. Yes.  
 8 Q. And they didn't do it?  
 9 A. Not to my knowledge.  
 10 Q. And had they done it, in all  
 11 probability this explosion would have been  
 12 avoided?  
 13 A. Yes.  
 14 Q. Okay. And they're not only  
 15 supposed to make the inspection, they are  
 16 supposed to log it, correct?  
 17 A. Yes.  
 18 Q. And maintain a log of all of the  
 19 inspections performed in suspect areas using any  
 20 type of sniffer device, correct?  
 21 A. That is correct.  
 22 Q. Do you know whether they have a log  
 23 of anything like that at Bradford?  
 24 A. Not off the top of my head, no.  
 25 Q. Do they have a multi gas tester

1 A. Yes, I did.  
 2 Q. What tests did you conduct?  
 3 A. Well, I used my gas tester,  
 4 explosion meter, sniffer as you call it, and  
 5 determined the oxygen level was the same as  
 6 normal atmosphere and didn't find any explosive  
 7 or flammable gases registering on the meter.  
 8 Q. Did you actually test the area  
 9 below the deck of the lazarette and above the  
 10 cement level in the --  
 11 A. Yes, I did.  
 12 Q. How did you go about doing that?  
 13 A. Climbed down in there and stuck my  
 14 hose wherever it was accessible and pumped the  
 15 sample into the meter and read the meter.  
 16 Q. Okay. What access points did you  
 17 have to put your hose into that area?  
 18 A. I don't recall specifically. I  
 19 know it was pretty well open at that point,  
 20 though. It was pretty well everything  
 21 dislodged.  
 22 Q. Did you perform any measurements?  
 23 Did you make any measurements of any either  
 24 plate displacement or anything else that you saw  
 25 in the area?



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1 A. No.  
 2 Q. Did you take any samples off of the  
 3 bottom of the aluminum deck plates in the floor  
 4 of the lazarette that had been blown upward by  
 5 the explosion?  
 6 A. No.  
 7 Q. Did you take any type of samples  
 8 anywhere on the vessel which were either  
 9 designed to or resulted in the preservation of  
 10 any type of residues, metal scrapings or other  
 11 evidence of the condition of the bottom of those  
 12 plates post explosion?  
 13 A. No.  
 14 Q. Did you perform any calculations in  
 15 connection with your inspection of the vessel  
 16 back in 1997?  
 17 A. No.  
 18 Q. As we sit here today have you  
 19 absolutely ruled out now any of the causes that  
 20 you mentioned as possible causes in your report  
 21 resulting from your examination of the vessel on  
 22 July 8th of 1997 or are they still possible  
 23 causes?  
 24 A. Any of the ones that I mentioned  
 25 are possible. But like I said, based on my

1 Q. I mean, to determine what the  
 2 interaction between the two would look like, if  
 3 there was one?  
 4 A. No, I never have.  
 5 Q. So I think what you're telling us  
 6 is that based on information that you heard from  
 7 somebody who you can't recall at a meeting that  
 8 you had after this explosion, your opinion now  
 9 is that the most likely cause of the explosion  
 10 was the interaction between the cement and the  
 11 aluminum producing hydrogen, is that what you're  
 12 telling us?  
 13 A. Based on that conversation and  
 14 going back and looking in the chemistry books  
 15 that I have as reference manuals in my office,  
 16 and like I say, talking with several chemist,  
 17 not just one, to me the most obvious source of a  
 18 flammable gas or vapor underneath that aluminum  
 19 was probably hydrogen gas because of this type  
 20 of reaction.  
 21 Q. How is that more probable than  
 22 methane gas resulting from degraded sea life  
 23 which accumulates, which would have accumulated  
 24 in that area?  
 25 A. Because we don't know whether there

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1 discussions with the other marine chemists and  
 2 thinking about this after this was, the report  
 3 was written, my conclusion was that it most  
 4 probably was a hydrogen explosion.  
 5 Q. Had you ever seen the results, the  
 6 results of the interaction between cement and  
 7 aluminum, the physical result of the interaction  
 8 between cement and aluminum either in this  
 9 particular instance or at anytime prior to this  
 10 instance in your career or in your education? Do  
 11 you know what I am saying?  
 12 A. You mean did I take a piece of  
 13 cement or look at a piece of cement that had  
 14 laid on aluminum and remove it and looked to see  
 15 if it was pitted or something?  
 16 Q. Sure?  
 17 A. No.  
 18 Q. Have you ever?  
 19 A. No.  
 20 Q. Okay, have you ever had the  
 21 occasion to look at say an aluminum railing that  
 22 was previously embedded into concrete walkways  
 23 in condominiums, apartment buildings, anything  
 24 like that?  
 25 A. Not in the vein of this kind of --

1 was sea life down there that could have  
 2 degraded. We do know the aluminum and the  
 3 cement were there. That is the difference.  
 4 Q. Okay.  
 5 A. I don't know whether the gasoline  
 6 got down there. I don't know whether the  
 7 acetone got down there. I don't know whether  
 8 the sea life was there.  
 9 They were asking me what would have  
 10 created something down there, maybe we wouldn't  
 11 have smelled, maybe we wouldn't have detected  
 12 because we didn't test. And those were the  
 13 possibilities that I came up with, I came up  
 14 with at the time.  
 15 Since then, like I say, the  
 16 discussion with several guys who were other  
 17 marine chemist who had different backgrounds  
 18 than I do, more so in chemistry than chemical  
 19 engineering said, well, that is a no brainer,  
 20 geez, if you put cement on top of aluminum you  
 21 are going to get a reaction and you are going to  
 22 get hydrogen. And a hydrogen explosion is a  
 23 very violent explosion.  
 24 Q. Other than the purely theoretical  
 25 concept did you see any physical evidence which

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1 would suggest to you as a chemist, as a marine  
2 surveyor, as a one hundred ton master or as a  
3 safety expert any evidence, any physical  
4 evidence that there was a reaction between the  
5 cement and the aluminum which did produce  
6 hydrogen gas in this particular case?

7 A. No.

8 Q. Did you ever determine whether  
9 anybody including Mr. Naranjo had been smoking  
10 in the hold of that vessel on that day, in the  
11 lazarette of that vessel?

12 A. I don't think I asked that  
13 question.

14 Q. Did you ever determine what the  
15 setting was on the welding device used by Mr.  
16 Naranjo when he, when the explosion occurred?

17 A. No.

18 Q. Did you know whether or not Mr.  
19 Naranjo had used any type of air extraction  
20 device in the lazarette prior to the time that  
21 he commenced welding operations?

22 A. I don't know specifically, but I  
23 don't believe that any was mentioned. I don't  
24 recall asking whether there was ventilation down  
25 there or not, to be honest with you.

1 A. Yes.

2 Q. The add-on portion, if that deck of  
3 the lazarette should have been ventilated, do  
4 you have an opinion as to whether or not the  
5 ventilation port should have been part of the  
6 design package for the extension of the vessel?

7 A. Not really.

8 Q. Okay.

9 A. I mean, if a person -- I am not  
10 quite sure what you're getting at or why you are  
11 asking. I mean, --

12 Q. I am asking --

13 A. The naval architects designed the  
14 vessel or this design, designed the extension.  
15 I don't know whether he was party to putting the  
16 cement down there or not.

17 At some point I understand that the  
18 cement was put down there because the vessel  
19 floated bow down and it was put on there to get  
20 the thing on trim, but whether he was party of  
21 that or whether that was the builder's decision  
22 versus the architect's decision, I don't know.

23 Q. When did you learn of that?

24 A. In talking to the people who had  
25 the vessel just recently because the cement is

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1 Q. Now, the lazarette certainly wasn't  
2 one of the areas that you certified as being gas  
3 free; is that correct?

4 A. No, that is correct.

5 Q. I want to make that clear for the  
6 record?

7 A. Yes.

8 Q. You mentioned earlier that there  
9 had been some discussion about ventilation of  
10 the area beneath the deck of the lazarette.

11 Have you ever designed an area  
12 similar to that?

13 A. No.

14 Q. If an area on board a vessel in  
15 your opinion should have a ventilation port,  
16 would that be a feature that would be a design  
17 feature in the vessel?

18 MR. FAMULARI: Object to the form.

19 THE WITNESS: I don't follow what  
20 you mean by that or what you're saying.

21 BY MR. VALLE:

22 Q. In other words, let's assume that a  
23 marine or that a naval architect had designed  
24 this portion of the vessel and I mean the  
25 portion aft of the original transom?

1 on the plans.

2 Q. Cement is on the plans for the  
3 entire ship, not just the extension?

4 A. I don't know that. All I know is I  
5 saw the plans that showed cement in the  
6 lazarette and I was told they put it there to  
7 get the vessel stern down and bow up. That is  
8 all I was told.

9 Q. Assuming that that was part of the  
10 input from the naval architect, would you defer  
11 to a naval architect as to whether or not that  
12 area should have been vented? And I am talking  
13 about the area beneath the lazarette?

14 MR. FAMULARI: Object to the form.

15 THE WITNESS: Let's just say I am  
16 surprised that naval architects would put  
17 cement against aluminum. And not  
18 necessarily because of the explosion hazard,  
19 but just because of the corrosion  
20 potential.

21 Cement normally is put into a  
22 vessel to stop a leak on a temporary basis  
23 until they can put a, make a permanent  
24 repair and get rid of a thin plate. It's  
25 not normally put into the bottom of a vessel

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1 to cover a whole area like this was done  
 2 other than for a specific purpose and the  
 3 conclusion that was told to me was it was  
 4 put there because the vessel was bow down.

5 I don't know whether that is true  
 6 or not, but it surprised me that one would  
 7 just fill this whole lazarette with cement.

8 BY MR. VALLE:

9 Q. Have you ever --

10 A. And put it against the aluminum.

11 Q. Have you ever examined or surveyed  
 12 any other vessels built by Palmer Johnson?

13 A. I don't recall.

14 Q. Okay. Do you do much work with  
 15 sailboats?

16 A. Yes.

17 Q. Is cement customarily used in  
 18 sailboats as ballast for the keel?

19 A. I have heard of it being used in  
 20 steel boats, not in aluminum boats.

21 Also in fiberglass boats. A mix of  
 22 cement with --

23 (Discussion off the record.)

24 MR. KALLEN: Did you finish your  
 25 answer? Go ahead and finish your answer.

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1 (Discussion off the record.)  
 2 (Thereupon, the above-mentioned  
 3 testimony was read by the reporter as above  
 4 recorded.)

5 THE WITNESS: -- With steel pellets  
 6 or chunks of steel as a poor man's ballast  
 7 instead of using lead.

8 That is where I see most of cement  
 9 ballast in sailboats.

10 BY MR. VALLE:

11 Q. Do you know of any chemical  
 12 reaction between concrete and other metals that  
 13 aren't galvanized?

14 A. I haven't really researched it, but  
 15 none that come to mind. Like I said, I am a  
 16 chemical engineer, not a chemist. My background  
 17 is a little bit different than the chemists that  
 18 brought this to my attention.

19 I had a lot of chemistry, but my  
 20 concentration was more on processes than the  
 21 reactions.

22 Q. When you were, I take it that when  
 23 you were in college you majored in chemistry?

24 A. Chemical engineering, big  
 25 difference.

1 Q. Okay. How many chemistry courses  
 2 did you take?

3 A. A number of them. I had organic  
 4 and inorganic chemistry and some others.

5 Q. Did you have qual and quant?

6 A. Yes.

7 MR. KALLEN: What?

8 THE WITNESS: Qualitative anylysis,  
 9 quantitative anylysis. Yes, like I said, my  
 10 concentration was more on the processes  
 11 which is what a chemical engineer deals with  
 12 more than the reactions themselves. So I am  
 13 stronger in that area.

14 BY MR. VALLE:

15 Q. Did you prepare any type of report  
 16 for Mr. Famulari or for anyone else in this  
 17 particular case?

18 A. No.

19 Q. Since the report that you prepared  
 20 in '97?

21 A. No.

22 Q. Have you met with Mr. Famulari or  
 23 spoken with either Mr. Famulari or anyone  
 24 representing the Plaintiff in this case prior to  
 25 the deposition today?

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1 A. Only to set it up. I don't believe  
 2 in any detail or with any opinions or anything  
 3 specific.

4 Q. I mean, you did mention to  
 5 somebody, didn't you, that you have got new  
 6 information that gave rise to this theory about  
 7 aluminum and concrete resulting in hydrogen or  
 8 is this the first time that you have mentioned  
 9 it to anybody, today?

10 A. Oh, I have mentioned it to lots of  
 11 people. I use it in my course since then.

12 Q. Okay. Have you mentioned it to  
 13 anybody on behalf of the Plaintiff before  
 14 testifying here today?

15 A. To be honest with you, I don't  
 16 recall.

17 Q. Did you have a conference with any  
 18 of the Plaintiff's counsel before today in which  
 19 you received a conference fee or anything like  
 20 that?

21 A. No.

22 Q. How many times say in the last  
 23 three years or so have you been called upon to  
 24 give testimony in either deposition or trial?

25 A. The last three years I don't think

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1 at all. Things have gotten safer down here.  
2 Ten, fifteen, twenty years ago I was a little  
3 busier.

4 Q. Have you testified in any courts in  
5 Florida in which you were recognized as an  
6 expert in any field?

7 A. Yes.

8 Q. Okay, which courts and which fields  
9 of expertise?

10 A. It was up in Broward County and I  
11 testified as an expert relative to the OSHA  
12 regulations, to some extent transportation  
13 regulations relative to where a gas tank that  
14 had been removed from a gas station had been  
15 pulled out of the ground and moved and then  
16 eventually blew up and injured a man, what the  
17 regulations were relating to that, shoreside  
18 similar to marine as far as the OSHA regulations  
19 go as to precautions before you put a torch to  
20 it.

21 That is the only court case that I  
22 have actually testified in court in.

23 Q. And when was that?

24 A. Had to be fifteen years ago.

25 Q. Okay, did you testify as an expert

1 say qualified person or whatever.

2 And there is no one with the  
3 professionalism as a marine chemist and no one  
4 really looking to hire or employ someone other  
5 than in their own in-house experts and those are  
6 industrial hygienist for the most part.

7 So when these situations arise on  
8 shore we are recognized as the experts on shore  
9 as well from the fact that a tank is a tank is a  
10 tank, clean is clean and so on. And  
11 therefore --

12 Q. Okay.

13 A. And therefore we are called upon to  
14 inspect shoreside tanks the same way as we  
15 inspect vessels afloat.

16 Q. Would it be fair to say in the only  
17 case that you have ever testified in, you were  
18 qualified as an expert in the field of safety as  
19 applied to the examination of hollow or void  
20 areas which were going to be subject to hot  
21 work?

22 A. That would be reasonable, yes.

23 Q. Okay. And you have never been  
24 recognized as an expert in the field of  
25 causation of explosions or causation of fires?

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1 in -- couldn't be marine chemistry because you  
2 were shoreside.

3 What was your -- In other words, --

4 A. Let me say this.

5 Q. I have got to rephrase the  
6 question.

7 A. Okay.

8 Q. Can you tell me, if you can recall,  
9 and maybe you can't recall, but tell me if you  
10 can recall what field of science that you were  
11 recognized by the court as an expert in in that  
12 particular case that you testified in fifteen  
13 years ago?

14 A. Relative to the OSHA regulations,  
15 relative to tank cleaning, whether things should  
16 have been tested, things like that.

17 There is no shoreside equivalent of  
18 a marine chemist because OSHA 1915 is specific  
19 to the marine industry and specifically  
20 specifies a marine chemist as required for some  
21 types of certifications prior to welding and  
22 entry, confined space entry and so on.

23 The shoreside industry which is  
24 1910, doesn't have a specific expert so  
25 designated. They just say experts. They just

1 A. No, no. Causation of fires, yes.  
2 Causation of explosions, no.

3 Q. I mean, in court, recognized as an  
4 expert in court in causation of fires, have you  
5 ever been qualified as an expert in that area?

6 A. Only to the extent that this man  
7 was burned and they wanted -- you know, I got  
8 involved in the fact that this thing burned him.

9 Q. And that was that one case that you  
10 were talking about?

11 A. Yes. I have been involved in a lot  
12 of cases where they never got to court.

13 Q. Sure.

14 A. So --

15 Q. How many times have you given your  
16 deposition in the last three years?

17 A. I think this is the only time in  
18 the last three years.

19 Q. Okay. Are you appearing here today  
20 pursuant to an agreement with anybody as far as  
21 what your fee would be for testifying here as an  
22 expert?

23 A. Yes.

24 Q. And who did you have the agreement  
25 with?

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1 A. Well, the check says Blanck &  
2 Perry.  
3 Q. Okay, blank like in a blank space  
4 or --  
5 A. B-L-A-N-C-K.  
6 MR. KALLEN: What is the amount of  
7 the check?  
8 THE WITNESS: Five hundred dollars.  
9 MR. KALLEN: Is that a retainer?  
10 THE WITNESS: No.  
11 MR. KALLEN: What is that?  
12 THE WITNESS: That is a half day  
13 fee for me.  
14 MR. KALLEN: Half day fee?  
15 THE WITNESS: Yes.  
16 MR. KALLEN: Okay.  
17 BY MR. VALLIE:  
18 Q. Thank you very much. Oh, one more  
19 second, please.  
20 MR. KALLEN: I have some follow-up,  
21 Larry.  
22 MR. VALLIE: I don't have anything  
23 further.  
24 MR. FAMULARI: No questions.  
25 RECROSS-EXAMINATION

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1 BY MR. KALLEN:  
2 Q. Before you go, I have a few  
3 follow-ups and I will try to make it quick?  
4 A. Okay.  
5 Q. Let me ask you a few questions  
6 about your qualifications.  
7 You referred to earlier, you said  
8 at one point in time you ran Broward Marine.  
9 What do you mean by that?  
10 A. I was in charge of their new boat  
11 construction. My boss was Kit Dennison who was  
12 the son of the owner, and I ran the entire new  
13 boat construction area and that was in 19 -- oh,  
14 boy, in the late seventies. '77 I think,  
15 somewhere in there, '78.  
16 Q. For about how many years?  
17 A. For a year.  
18 Q. Okay, and did the new boat  
19 construction involve aluminum boats?  
20 A. Aluminum boats.  
21 Q. Of what size approximately?  
22 A. Oh, 80, 90 feet, somewhere in that  
23 ballpark.  
24 Q. Other than working at Broward  
25 Marine have you been employed in any other ship

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1 repair, shipbreak, ship construction facility?  
2 A. None other than the company that I  
3 had in California where we were building  
4 fiberglass boats.  
5 Q. Okay, you mentioned the California  
6 company?  
7 A. Yes.  
8 Q. And how many years did you do that?  
9 A. A couple of years. We got stopped  
10 by the gasoline crisis.  
11 Q. Did I understand you correctly that  
12 in order to be certified as marine chemist part  
13 of your qualifications require some experience  
14 as a welder?  
15 A. No.  
16 Q. Where did I hear --  
17 A. Experience in the shipyard  
18 industry, shipyard practices, configuration of  
19 ships, how they are structured.  
20 Q. Have you ever worked as a welder?  
21 A. No. I never finished all of that,  
22 but there is a lot more to becoming a marine  
23 chemist than what I discussed, but it is like  
24 getting a Ph.D., you write a thesis and you have  
25 oral exams and written exams and all kinds of

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1 stuff. It's extensive.  
2 Q. This is the first explosion case  
3 that you you have investigated, is that my  
4 understanding? Is that what you said before?  
5 A. Yes.  
6 Q. Have you since investigated any  
7 other explosion cases?  
8 A. No.  
9 Q. Have you -- other than referring  
10 back to whatever chemistry manuals you may have  
11 in your office after you having heard this  
12 aluminum concrete theory at this seminar  
13 mentioned, have you done any other independent  
14 research or investigation to educate yourself,  
15 if you will, concerning the production of  
16 hydrogen gas as a result of the interaction  
17 between aluminum and concrete?  
18 A. Nothing more than looking in a  
19 chemistry textbook and seeing the reaction  
20 written there and saying, yes, it happens.  
21 Q. Okay, now, from hearing your  
22 testimony I take it that as of 1997 even though  
23 you had been in the marine industry for quite a  
24 number of years and had been --  
25 A. Twenty years at that time.



1 Q. Had been a marine chemist for a  
2 number of years, had your master's license to  
3 operate vessels, had other shipyard experience,  
4 this particular theory as far as the production  
5 of hydrogen gas as a result of the interaction  
6 between aluminum and concrete was not known to  
7 you, would that be fair to say?

8 A. Probably true, yeah.

9 Q. So in the truest sense of the word  
10 if I refer to common knowledge and by common  
11 knowledge I will talk about non, I am referring  
12 to non-experts, non-experts knowledge, common  
13 knowledge that the everyday person or even a  
14 captain may know, would it be fair to say that  
15 it would not be common knowledge at least as of  
16 1997 for someone such as a captain to know that  
17 there could possibly be the production of  
18 hydrogen gas as a result of the interaction  
19 between aluminum and concrete?

20 MR. VALLE: Objection to the form.

21 BY MR. KALLIN:

22 Q. Fair to say?

23 A. I would say that is true.

24 Q. Is there a bible or treatise that  
25 you as a marine chemist refer to as part of your

1 work and by bible I mean, you know, a book that  
2 you can go to and say this is authority?

3 For example, for us lawyers we  
4 refer to Valle on taking depositions. We  
5 consider that the bible.

6 A. Well, I have a set of regulations  
7 that I am required to go by.

8 Q. Other than OSHA?

9 A. No, no, I have NFPA 306.

10 Q. And what does 306 refer to?

11 A. That is -- I didn't bring a copy  
12 with me. I am trying to remember the title.

13 Q. Does it deal with welding?

14 A. It deals with everything I am  
15 required to do. It deals with hot work.

16 Q. Okay.

17 A. They don't call it welding, it is  
18 called hot work because hot work can be any  
19 spark producing operation including using a  
20 drill, including sandblasting.

21 Q. Okay.

22 A. Chipping.

23 Q. And that is NFPA --

24 A. 306, yes. And those regulations  
25 are referred to in here by reference and it's,

1 it specifies under the welding hot work portion  
2 of this, it says that marine chemists, NFPA  
3 marine chemists and 306 are to be used in  
4 certain areas when it talks about welding.

5 Q. Did you measure the aluminum  
6 subfloor or deck in the lazarette back in 1997?

7 A. Measure it how?

8 Q. Well, measure its thickness or  
9 thinness?

10 A. No.

11 Q. Sitting here today can you tell us  
12 whether it was a half inch, quarter inch, three  
13 sixteenths?

14 A. I couldn't tell you offhand. It  
15 wasn't real thick, but it wasn't half inch.

16 Q. Okay. Did you observe there being  
17 any portion of the lazarette having been  
18 recently painted or is that something that you  
19 didn't look for? Again going back to 1997?

20 A. I am trying to recall. I don't  
21 recall whether it was painted or not or had it  
22 been recently painted.

23 Q. Do you know whether or not below  
24 the lazarette deck or subfloor there had been  
25 any painting application to the concrete or

1 aluminum on the concrete?

2 A. There wasn't any paint on top of  
3 the concrete when I saw it. And based on what  
4 we discussed earlier I don't think that there  
5 was any access to do so after it was closed up.

6 Q. I don't know if -- Let me ask you  
7 this.

8 Do you know for a fact whether the  
9 deck in the lazarette or subfloor as it has been  
10 referred to was in fact airtight and  
11 watertight?

12 MR. VALLE: Prior to this  
13 explosion?

14 BY MR. KALLIN:

15 Q. Yes, prior to the explosion?

16 A. Well, I don't know as a fact.

17 Q. Okay.

18 A. No.

19 Q. You are prepared to surmise, I take  
20 it?

21 A. As I recall, the floor that was on  
22 top of the structurals, in other words, the  
23 floor of the lazarette which was two inches  
24 above the concrete, was tight enough around the  
25 perimeter and where any plates were put together

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1 that there wouldn't have been much air  
2 movement.  
3 Now, it wasn't airtight that it  
4 wouldn't have -- had you put pressure on it  
5 would have held pressure. It wasn't airtight  
6 that way or watertight that way, so liquids  
7 could have gone underneath it as I recall, but I  
8 can't tell you for sure one way or the other.  
9 That was just the impression that I got at the  
10 time that we discussed what was the condition of  
11 this before the explosion and I don't recall  
12 specifically other than that.  
13 Q. Wasn't there not a bilge pump in  
14 the lazarette that was installed?  
15 A. I believe there was a sump and I  
16 don't recall whether it was -- I don't recall  
17 whether it was -- I don't recall whether there  
18 was cement where the sump was or not because it  
19 wouldn't have made sense to have the sump on top  
20 of the cement.  
21 It would have made sense to have an  
22 area where there was no cement where all of the  
23 water would drain to a lower area where the pump  
24 would be, but I don't recall.  
25 Q. Well, I guess my question is were

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1 there not some items of equipment or machinery,  
2 as few as they may have been, that were  
3 installed through the deck of the lazarette such  
4 as the sump pump?  
5 MR. FAMULARE: Are you talking into  
6 the sub area?  
7 THE WITNESS: Into the area where  
8 the cement was?  
9 BY MR. KALLIN:  
10 Q. Well, I don't know if its actually  
11 into the cement.  
12 A. Not, what I mean, into the area  
13 below that subfloor as we are calling it.  
14 Q. Yes, sure?  
15 A. I don't recall anything installed  
16 through there.  
17 Q. I am not sure if I am using the  
18 right term, but vaporization or how quickly a  
19 vapor will dissipate once it's subject to  
20 oxygen, and let me use an example.  
21 I am familiar with if there is  
22 escaping fuel the vapor will quickly expand into  
23 the surrounding oxygen, but at some point in  
24 time dissipates so it is no longer present. Do  
25 you follow me on that?

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1 And I don't know if what I said is  
2 accurate.  
3 A. I hear what you're saying. I am  
4 not sure where you are going. Maybe I can help  
5 you if you keep talking.  
6 Q. Is there such a term as LEL or --  
7 A. Yes.  
8 Q. And does that refer to at what  
9 point or what level a vapor is actually  
10 ignitable?  
11 A. It refers to at what level an  
12 atmosphere will be explosive. The lower  
13 explosive limit is the limit at which an air or  
14 let's say oxygen, air, whatever mixture and  
15 whatever flammable liquids that may evaporate  
16 into it or if it were hydrogen, hydrogen mixed  
17 with it, whatever, one hundred percent LEL would  
18 be the point at which if you had a spark it  
19 would explode.  
20 Q. Okay.  
21 A. And ten percent would be, mean  
22 there would be ten percent of the amount of  
23 whatever the contaminant was with normal air to  
24 cause it to explode.  
25 Q. There needs to be a certain

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1 percentage of mixture between the ignitable  
2 vapor, if you will, and the oxygen in order for  
3 that mixture to become ignitable?  
4 A. Right, if you don't have enough  
5 oxygen there it won't explode because then it is  
6 considered inert and you go below a certain  
7 level of oxygen and nothing will explode.  
8 Q. Or if you exceed a certain level of  
9 oxygen that vapor won't explode either, if it  
10 becomes too rich, the mixture?  
11 A. If the mixture becomes richer, not  
12 if the oxygen becomes richer.  
13 Q. If the mixture becomes too rich or  
14 not rich enough to begin with, it wouldn't  
15 ignite; fair to say?  
16 A. I am sorry, I got distracted. Say  
17 that again.  
18 Q. If the mixture is either not rich  
19 enough or too rich, it won't ignite?  
20 A. It won't ignite.  
21 Q. So there is an explosive or  
22 ignitable range --  
23 A. Yes, that is correct.  
24 Q. -- For this mixture?  
25 A. That is correct.

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1 MR. VALLE: When you say range you  
 2 mean temperature range?  
 3 THE WITNESS: No, concentration  
 4 range.  
 5 MR. VALLE: Air gas mixture?  
 6 THE WITNESS: Yes, concentration  
 7 range.  
 8 BY MR. KALLEN:  
 9 Q. Do you know what the ignitable  
 10 range is for hydrogen?  
 11 A. I could look it up, but off the top  
 12 of my head I don't know.  
 13 Q. Do you know what the ignitable  
 14 range is for methane?  
 15 A. Same answer. An explosimeter is  
 16 designed, or gas tester, is designed to work  
 17 with all of these various combinations and it's  
 18 not specific --  
 19 Q. Okay.  
 20 A. -- To -- so we don't, a marine  
 21 chemist doesn't need to know, well, the  
 22 flammable range is between here and here or  
 23 there and there.  
 24 All we need to know is okay, it is  
 25 going to react and if we get a reading we know

1 If you have got enough oxygen there  
 2 for some of the hydrogen to combine two to one  
 3 with oxygen you then create H2O which is water,  
 4 and at some point you are going to run out of  
 5 either hydrogen or oxygen and that reaction  
 6 stops.  
 7 So as long as you have got some  
 8 amount of both and a spark or an ignition source  
 9 it's going to proceed. It's not exactly the  
 10 same as having an explosive limit for a  
 11 flammable vapor which oxidizes in the presence  
 12 of oxygen, because you are talking about a  
 13 chemical reaction versus a burning or  
 14 combustion.  
 15 And it would be slightly different.  
 16 But there is an LEL reading that can be obtained  
 17 and below which you can have a small enough  
 18 concentration where you wouldn't start this  
 19 reaction with hydrogen.  
 20 Q. Okay.  
 21 A. But once you get to a certain point  
 22 from there there is no upper explosive limit,  
 23 let's put it that way, like you would have where  
 24 it would be too rich in my opinion, without  
 25 researching this. I am just talking off the top

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1 that there is something there.  
 2 Q. You need to know if it is there?  
 3 A. Exactly.  
 4 Q. Okay.  
 5 A. I don't need to to know whether it  
 6 is this amount versus this amount.  
 7 Q. I understand.  
 8 A. All I care is if it is there, I  
 9 want it out of there.  
 10 Q. Okay.  
 11 MR. VALLE: Excuse me, so I am  
 12 clear -- Are you using or would you use the  
 13 term ignitable range and ignition point or  
 14 flash point interchangeably?  
 15 THE WITNESS: No.  
 16 MR. VALLE: Okay, I will get to it.  
 17 BY MR. KALLEN:  
 18 Q. Would there be some point in time  
 19 at which the mixture between say hydrogen and  
 20 available oxygen in a space would become too  
 21 rich for it to ignite, if you know?  
 22 A. I would -- I would have to say no  
 23 because when you have a hydrogen explosion you  
 24 have a chemical reaction between hydrogen and  
 25 oxygen.

1 of my head, versus where you can get too rich  
 2 like in your carburetor and you flood it and it  
 3 doesn't start.  
 4 Q. I guess my next question is, if you  
 5 know, do you know what the LEL is for hydrogen  
 6 and oxygen mixture?  
 7 A. Well, that is not the right  
 8 question to ask, but --  
 9 Q. Wrong term?  
 10 A. Yes.  
 11 Q. Okay.  
 12 A. In other words, the minimum  
 13 concentration of hydrogen to create the one  
 14 hundred percent LEL and, no, I don't know that  
 15 off the top of my head. I would have to look it  
 16 up.  
 17 Q. All right, just a couple of more  
 18 questions.  
 19 When you go on board and gas free  
 20 or, I am sorry, certify as being gas free a  
 21 particular space on the vessel such as the  
 22 engine room --  
 23 A. Right.  
 24 Q. You prepare a certificate?  
 25 A. Yes.

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1 Q. And there are multi copies to it  
2 which you give to the yard?  
3 A. Yes.  
4 Q. And it's not your job to post these  
5 certificates?  
6 A. No.  
7 Q. But I am sure that you have been on  
8 board vessels where you have seen perhaps your  
9 own certificate posted?  
10 A. Certainly.  
11 Q. And is there a common area or a  
12 generally accepted area where that certificate  
13 is posted?  
14 A. It is specified where it's supposed  
15 to be posted. It is either supposed to be  
16 posted at the gangway or in the area accessible  
17 to the welder where he can read it when he does  
18 the work.  
19 So sometimes if, if there are  
20 fifteen areas specified on a certificate, it's  
21 easier to post it at the gangway where anybody  
22 going on board can read all of the fifteen  
23 areas. It's easier to do that than put fifteen  
24 of them at the fifteen different locations and I  
25 am talking on a larger vessel now.

1 world that does one hundred percent of what  
2 they're supposed to be doing and, you know --  
3 MR. VALLE: Shocked, shocked.  
4 THE WITNESS: Amazing, isn't it?  
5 But my problem is that, you know, I tell  
6 people, here is what you are supposed to be  
7 doing and I am happy sometimes if fifty  
8 percent or sixty percent or eighty percent  
9 of it gets done and in some yards they do  
10 their best and they still don't do one  
11 hundred percent. In another yard they don't  
12 care and they don't do ten or fifteen  
13 percent of it.  
14 I wouldn't characterize Bradford as  
15 being one of those yards that didn't care.  
16 I don't want you to -- I don't want to lay  
17 that impression, but they like most of the  
18 other yards down here didn't do one hundred  
19 percent of what they were supposed to be  
20 doing.  
21 BY MR. KALLEN:  
22 Q. Let me ask you this then. On the  
23 certificate itself that you fill out you  
24 identify the area that you have inspected to be  
25 gas free?

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1 Q. Okay.  
2 A. So, you know, it depends on what is  
3 most practical in the yard and the size of the  
4 vessel.  
5 Q. Sure. And I take it by what you  
6 just said that the purpose of posting the  
7 certificate is to make the worker, say in this  
8 case the welder, aware?  
9 A. That is correct.  
10 Q. And the welder should be on notice  
11 of looking for a certificate before he begins to  
12 weld?  
13 A. Either a chemist certificate or the  
14 competent person's inspection log.  
15 Q. Okay, and --  
16 A. Or both.  
17 Q. And if he doesn't see one relating  
18 to the area where he is welding, would it be  
19 prudent for him to ask?  
20 A. Now you get into an area of what  
21 does the yard normally do and --  
22 Q. I am talking --  
23 A. I understand what you're saying.  
24 My problem is this. There isn't any yard I have  
25 ever been in anywhere in this country or in the

1 A. Correct.  
2 Q. You identify the date it was done?  
3 A. Yes, and the time.  
4 Q. And the time?  
5 A. Yes.  
6 Q. And I take it that these  
7 certificates are prepared and filled out in a  
8 way that workers themselves understand them?  
9 A. Yes.  
10 Q. I mean, why post them if they would  
11 not understand what they're saying?  
12 A. Other than the fact that I get, I  
13 don't write in Haitian or Spanish very well.  
14 Q. No, I understand, but -- but you  
15 try and be as straightforward in your  
16 description in a certificate as possible I would  
17 imagine?  
18 A. Yes, correct, we use general  
19 terminology standard in the industry.  
20 Q. So a worker again who looks at it  
21 should be able to understand assuming he  
22 understands English or --  
23 A. Right.  
24 Q. Okay. Or some English, anyway, and  
25 knows some shipboard terminology?

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1 A. Well, the terms that would be on  
2 there would be such and such fuel tank, such and  
3 such engine room and it would safe for workers,  
4 safe for hot work or not safe for workers, not  
5 safe for hot work.  
6 Q. Okay.  
7 A. That is the terminology. Pretty  
8 simple terminology.  
9 Q. So if a worker looks at the  
10 certificate that you posted back in May of 1997,  
11 he would see, oh, this is for the fuel tanks or  
12 for the engine room, whatever the case may be?  
13 A. Exactly.  
14 Q. It doesn't say lazarette, it  
15 doesn't say aft cockpit --  
16 A. No, no.  
17 Q. -- Or what have you?  
18 A. No, it wouldn't have listed those  
19 areas if I was talking about the engine room  
20 fuel tanks or some other areas of the vessel.  
21 Q. Okay.  
22 A. I don't give blanket certificates.  
23 As much as people would love me to, I wouldn't,  
24 I don't.  
25 Q. I was referring to this before and

1 Q. Okay.  
2 A. -- Or less where it won't explode,  
3 it could still be flammable.  
4 Q. Okay, and do you know --  
5 A. The problem being if you are at one  
6 hundred percent LEL no one could stand to breath  
7 it and they're going to do something about it.  
8 Q. But if it begins to mix with oxygen  
9 in the open air --  
10 A. It eventually blows away, yes.  
11 Q. But do you know how long it would  
12 take for that to happen?  
13 A. No, you can't describe that because  
14 it depends on the dilution factor, how much wind  
15 you got, how much air you got, you know.  
16 Q. How big the space is?  
17 A. Yes, there are people who run whole  
18 courses just in ventilation, people who run  
19 whole courses in how to ventilate places and  
20 stuff for this very purpose, because we run into  
21 toxics on tankers and whatever, you know, things  
22 that you have to deal with.  
23 Q. I have nothing else. Thank you.  
24 RECROSS-EXAMINATION  
25 BY MR. VALLE:

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1 I got off based on this.  
2 Say, for example, acetone, if it  
3 spills does it then vaporize? In other words,  
4 it will give off vapors?  
5 A. Yes, it evaporates. This is where  
6 we are coming to -- someone mentioned flash  
7 point a minute ago.  
8 Q. Okay.  
9 A. Yeah.  
10 Q. At some point in time after it has  
11 spilled and has given off a vapor, at some point  
12 in time after that I would assume it no longer  
13 is ignitable, whatever that point in time may  
14 be?  
15 A. I can't answer that. Restate the  
16 question.  
17 Q. Well, if acetone spills let's say  
18 on a wood deck, will it leave a stain?  
19 A. Probably not.  
20 Q. Okay. If it is cleaned up will it  
21 eliminate the possibility of it being ignited?  
22 A. No, because if you mop up the  
23 liquid the portion that has evaporated, unless  
24 it has been diluted by oxygen to the extent that  
25 it is below the LEL --

1 Q. One or two more. What is your  
2 distinction between an ignition point or flash  
3 point and the one hundred percent LEL?  
4 A. Well, one hundred percent LEL --  
5 Boy, I am trying to think how to do it without  
6 getting in a whole course on this stuff.  
7 Q. Let me see if I can rephrase it.  
8 When you get an air gas mixture it indicates one  
9 hundred percent LEL?  
10 A. You have a spark and that is going  
11 to explode.  
12 Q. Okay, that is the flash point, that  
13 is the explosion point?  
14 A. Yes, right.  
15 Q. Anything less than that the air gas  
16 mixture isn't sufficient for an explosion to  
17 occur, correct?  
18 A. That is correct.  
19 Q. Just generally in most cases?  
20 A. Yes.  
21 Q. I know there are probably  
22 exceptions to every rule.  
23 A. Well, yes, we are generalizing and  
24 I agree with that.  
25 Q. Okay. Assuming that volatile



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1 liquids, gasoline, acetone, paint thinner,  
 2 paint, other things had spilled in the area of  
 3 the lazarette or on the wood decks above the  
 4 lazarette and had somehow or other found their  
 5 way, as liquids do on a vessel, underneath the  
 6 deck of the lazarette, and become entrapped in  
 7 that space beneath the deck of the lazarette,  
 8 then although the liquids may have evaporated,  
 9 the vapors would have been trapped under the  
 10 deck of the lazarette, would they not?  
 11 MR. KALLEN: Object to the form.  
 12 THE WITNESS: Very possibly, yes.  
 13 BY MR. VALLE:  
 14 Q. So that the fact that it might have  
 15 happened days or weeks before wouldn't really  
 16 have indicated that the vapors would necessarily  
 17 have dissipated if they were trapped in that  
 18 area?  
 19 A. That is correct, that is like I was  
 20 talking before about the gasoline in the bilge  
 21 of a boat.  
 22 Q. That is why you got to test those  
 23 areas --  
 24 A. Yes.  
 25 Q. -- Before you do any hot work

1 to the extent where you are going create an  
 2 explosive mixture.  
 3 Q. Okay.  
 4 A. You heat up diesel to 150 or 160  
 5 Fahrenheit, it will be as dangerous as gasoline  
 6 at room temperature.  
 7 Q. The point of the question, I think,  
 8 is do you know or do you have any opinion as to  
 9 the flash point temperature that would have  
 10 been, that would have had to have existed in  
 11 that hollow space beneath the lazarette for this  
 12 explosion to have occurred in 1997?  
 13 A. That is an incorrect use of the  
 14 terms.  
 15 Q. Okay.  
 16 A. The flash point applies to a  
 17 specific liquid. So acetone has one flash  
 18 point, gasoline has a different flash point,  
 19 different temperature and so on.  
 20 Q. Exactly my point. Do you know as  
 21 we sit here today?  
 22 A. Acetone and gasoline both have  
 23 flash points that would be below room  
 24 temperature, so they would have the tendency to  
 25 create an explosion, explosive atmosphere at

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1 there?  
 2 A. Exactly, yes. Let me go back to  
 3 what you're talking about about flash point just  
 4 to be more definitive.  
 5 Flash point is a temperature,  
 6 okay. The flash point of gasoline, for  
 7 instance, is, I don't know, minus twelve or plus  
 8 twelve Fahrenheit or something like that. And  
 9 that is below room temperature. So you know  
 10 that it will have a big tendency to evaporate at  
 11 room temperature which is say eighty degrees  
 12 Fahrenheit.  
 13 You take diesel, for instance,  
 14 which the flash point is 150 degrees Fahrenheit  
 15 and it doesn't have the tendency to evaporate to  
 16 one hundred percent LEL at room temperature  
 17 because it doesn't want to evaporate until you  
 18 get up towards 150.  
 19 So that is the relationship between  
 20 flash point, which is a temperature that  
 21 describes, that is a way to describe whether  
 22 something has a tendency to evaporate and then  
 23 based on that tendency how much is going to  
 24 accumulate or how much is going to, going to  
 25 want to accumulate or evaporate, I should say,

1 room temperature.  
 2 Q. Methane would too, wouldn't it?  
 3 A. Methane is a gas, it doesn't have a  
 4 flash point. But methane would just accumulate  
 5 because it is a gas.  
 6 Q. Well, call it an ignition point?  
 7 A. Right, right.  
 8 Q. In other words, isn't there a  
 9 temperature at which --  
 10 A. Well, methane maybe -- No, methane  
 11 does have a flash point because you can liquify  
 12 methane, but, I mean, it is so low that it is  
 13 always commonly found as a gas anytime that, you  
 14 know, that you seen it around.  
 15 Q. How hot, and maybe I will just put  
 16 it in lay terms, how hot would that area have to  
 17 be inside or do have an opinion as to how hot  
 18 the area would have gotten or had to have gotten  
 19 inside that space beneath the lazarette for this  
 20 explosion to have occurred, or would that depend  
 21 on the substance?  
 22 A. It has nothing no with the  
 23 temperature. It has to do with whatever it was  
 24 that exploded.  
 25 What you need to have is you need

1 to have a flammable mixture of oxygen plus  
2 something that will react with the oxygen. And  
3 then you have to have a source that will ignite  
4 it which would be the welding torch, the spark.

5 Q. That is what I mean.

6 A. But as far as -- I mean, okay, now  
7 your'e getting into something that is completely  
8 different and that is the auto ignition  
9 temperature.

10 In other words, if you have it  
11 without putting a spark there you can make  
12 something burn all by itself without putting a  
13 spark to it. In other words, you heat up diesel  
14 at four hundred Fahrenheit you don't have to put  
15 a spark on it, it will just spontaneously --  
16 just like if you put a piece of paper in your  
17 oven at home and you get the oven hot enough, it  
18 will start to burn without even putting a match  
19 in there.

20 Q. But --

21 A. It will burn. That is all the auto  
22 ignition temperature is.

23 Q. Doesn't each substance and each gas  
24 have a temperature requirement which you need to  
25 meet before there is an ignition?

1 A. That is the ignition temperature.

2 Q. Okay.

3 A. And that is up three, four, five,  
4 six hundred Fahrenheit which is hotter than  
5 anything we normally encounter, but much cooler  
6 than what a spark would be.

7 Q. Do you have an opinion as to  
8 whether or not the welding on this particular  
9 day when the explosion occurred penetrated the  
10 deck plate of the lazarette?

11 A. I don't know if he got that far.

12 Q. That is exactly the question. That  
13 is what I wanted to know.

14 A. No.

15 Q. Do you know whether he got that  
16 far?

17 A. I have no idea. I don't know.

18 Q. And in all of the substances that  
19 we have been discussing would he have  
20 necessarily have to have gotten that far for the  
21 explosion to have occurred or is that just  
22 conjecture depending on your --

23 A. That is conjecture depending on  
24 what it was.

25 Q. Okay.

1 A. It takes a certain amount of energy  
2 to make something explode and if you heat it up  
3 to four hundred Fahrenheit something  
4 spontaneously combusts. I don't know what it  
5 takes to make hydrogen and oxygen react to  
6 combine or make water. I don't know what that  
7 takes, I would have to look it up.

8 It takes a certain amount of  
9 energy. Now, would a spark do it, yes. Would  
10 heating the aluminum up to fourteen hundred  
11 Fahrenheit, which is the melting point of  
12 aluminum, I don't know, in absence of the  
13 spark.

14 In other words, if he was only on  
15 top of the deck and this was underneath the deck  
16 and all you were doing was heating the aluminum  
17 up, I don't know whether that would create that  
18 or not. I can't tell you without doing some  
19 research.

20 Q. Do you recall from any observation  
21 that you made on the day that you examined this  
22 vessel on July the 8th of 1997, as to whether or  
23 not the deck plate in the area where Mr. Naranjo  
24 was welding was penetrated by the weld?

25 A. That I don't know.

1 Q. Okay. If the deck plate was  
2 penetrated by the weld prior to the explosion  
3 would you expect that that hole would still be  
4 there today, if the deck plate were preserved?

5 A. You normally don't penetrate a  
6 plate when you are welding. You don't burn a  
7 plate through the hole when you are welding.

8 The whole idea is when you are  
9 welding is to fill something up with the welding  
10 wire where you got two gaps to put two pieces of  
11 plate together.

12 Q. The question is, if a hole existed,  
13 let's assume for some reason or other that the  
14 weld, the welding iron went through the plate,  
15 the quarter inch plate, assuming that existed at  
16 the time, that would still be there, wouldn't  
17 it, if the plate had been preserved and we would  
18 be able to tell whether or not the substance  
19 beneath was subject to a direct heat from the  
20 welding torch or just the heat from the bottom  
21 of the plate?

22 A. I don't know, I am not an expert.  
23 My personal opinion would be had there been, had  
24 there been a specific source where this  
25 explosion occurred I would have expected that

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1 point to probably have shown some sort of  
2 displacement.  
3 Q. Okay.  
4 A. But the whole deck came up for the  
5 most part.  
6 Q. But it came up --  
7 A. So there was explosion underneath  
8 the whole plate.  
9 Q. But the plate blew apart at the  
10 seam, didn't it? It didn't blow apart at any  
11 particular hole or puncture hole or weld?  
12 A. Not to my recollection, that is  
13 correct.  
14 Q. She blew at the seam?  
15 A. Yes, several seams. But you see,  
16 and this is why, going back to the hydrogen  
17 theory, I have seen places where they have had a  
18 confined space and someone puts, someone puts a  
19 torch or something to a hole and it doesn't blow  
20 up, it burns like what underneath is part of  
21 what is inside of a fuel tank and then it burns  
22 out one hole.  
23 Whereas a hydrogen explosion is  
24 something that propagates continually through  
25 and it is --

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1 Q. You are saying hydrogen doesn't  
2 burn? Pure hydrogen, you are saying if you put  
3 a torch to pure hydrogen it won't burn, it will  
4 blow up; is that what you're saying?  
5 A. Hydrogen -- No, what you are  
6 saying, it will burn, but if you have a hydrogen  
7 oxygen mixture and you put a spark to it it will  
8 react and explode because of the, the tendency  
9 to turn into water and it is --  
10 In other words, if you have --  
11 let's say this. The propagation of the flame  
12 from the place where you ignite it is going to  
13 be so fast that it will go through the whole  
14 tank and explode versus it's not going to suck  
15 the fuel over here like you would have like in a  
16 butane lighter or something like that where you  
17 got --  
18 That is why your butane lighter  
19 doesn't explode, because it only comes out one  
20 place and as it comes out the butane burns with  
21 the oxygen.  
22 Q. If you had hydrogen, though --  
23 A. It don't suck back down in and  
24 create -- You know, if you had hydrogen in that  
25 butane lighter the thing would blow up. The

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1 whole lighter would blow up inside of it, if you  
2 had oxygen in there with the hydrogen.  
3 Q. You mean if you had a hydrogen  
4 lighter and -- silly concept, but if you had a  
5 hydrogen lighter under pressure --  
6 A. Right.  
7 Q. -- And there was liquid hydrogen and  
8 the only way that it could escape was through a  
9 small hole --  
10 A. It wouldn't blow up.  
11 Q. Okay. You would have a fire there?  
12 A. Yeah, you would have a fire there,  
13 but if you had, if you had oxygen down inside  
14 with the hydrogen it would propagate back down  
15 and blow up. If you had oxygen in there with  
16 the butane it wouldn't do that. It would come  
17 out.  
18 It is -- It is difficult to explain  
19 the differences without getting really  
20 technical, but there is a difference in what  
21 happens when the hydrogen reacts and explodes  
22 because it is a reaction, not just a combustion.  
23 MR. VALLE: Okay, nothing further.  
24 (Discussion off the record.)  
25 (Thereupon, the deposition was

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1 concluded at 1:25 p.m. and the formalities  
2 of reading and signing were waived.)  
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CERTIFICATE OF OATH

STATE OF FLORIDA  
COUNTY OF DADE

I, the undersigned authority,  
certify that Peter Rimmel personally appeared  
before me and was duly sworn.

WITNESS my hand and official seal  
this 9th day of March, 2001.

JULIO A. MOCEGA  
Notary Public- State of Florida  
My Commission Expires: 6-29-2002

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CERTIFICATE OF REPORTER

STATE OF FLORIDA  
COUNTY OF DADE

I, JULIO A. MOCEGA, Registered  
Professional Reporter, certify that I was  
authorized to and did stenographically report  
the foregoing proceedings; and that the  
transcript is a true and accurate record.

I further certify that I am not an  
attorney or counsel of any of the parties, nor a  
relative or employee of any attorney or counsel  
connected with the action, nor financially  
interested in the action.

Dated this 9th day of March, 2001.

JULIO A. MOCEGA, R.P.R.  
State of Florida  
County of Dade

The foregoing certificate was acknowledged  
before me this day of 2001  
by Julio A. Mocega, who is personally known to me.

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NARANJO vs. STEPHEN B. SMITH

Condensed

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